Chapter 35 CADD Data and GIS

CONNECTIONS AND GEODATABASES

ADD A CONNECTION TO CADD DATA

Open ArcCatalog

Start ArcCatalog by using your desktop icon.

Setup Connection to PIN

From the main menu (Figure 35-1), select **File>Connect to Folder…**

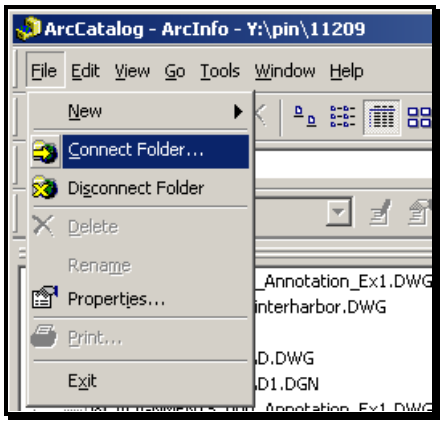


Figure 35-1: Selecting Connect to Folder from the File Menu.

When the *Connect to Folder* dialog opens, browse to the Y: drive (dot0dta1fscadd1\pcpin1). Locate your PIN (i.e. Y:\pin\11584). Select your PIN's folder, click **OK** (Figure 35-2). Now you should see the connection alphabetically in your list of files and folders within ArcCatalog.

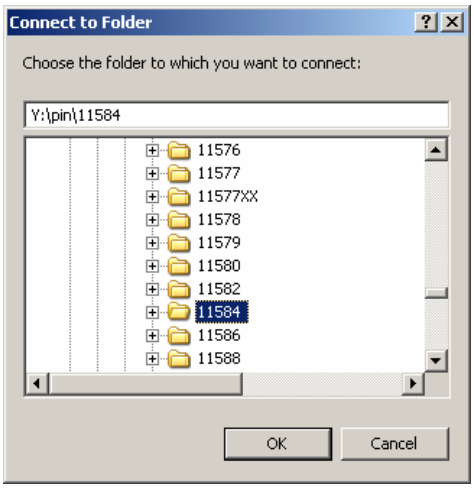


Figure 35-2: Connect to Folder dialog box.

ⓘ ***It is not recommended to make a connection to the root of the Y: drive or the Y:pin folder. ArcCatalog takes a long time to analyze all of the data it finds. It's best to have it look to the PIN you are working with.***

ADD CONNECTION TO GISDATA\CADD FOLDER G:DRIVE

Setup Connection to GISDATA

From the main menu (Figure 35-3), select **File>Connect to Folder…**

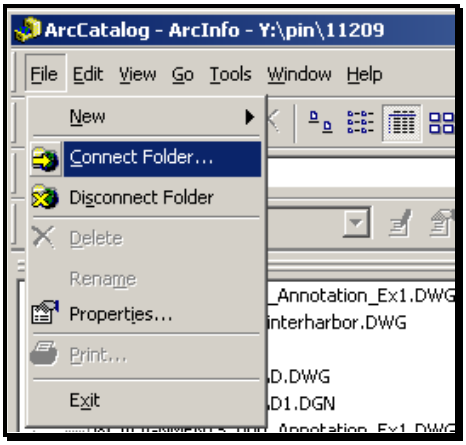


Figure 35-3: Selecting Connect to Folder from the File Menu.

When the *Connect to Folder* dialog opens, browse to the G: drive (dot0dta1fsaug01\gisdata). Expand the G: drive to locate the CADD folder. Select it and click **OK** (Figure 35-4).

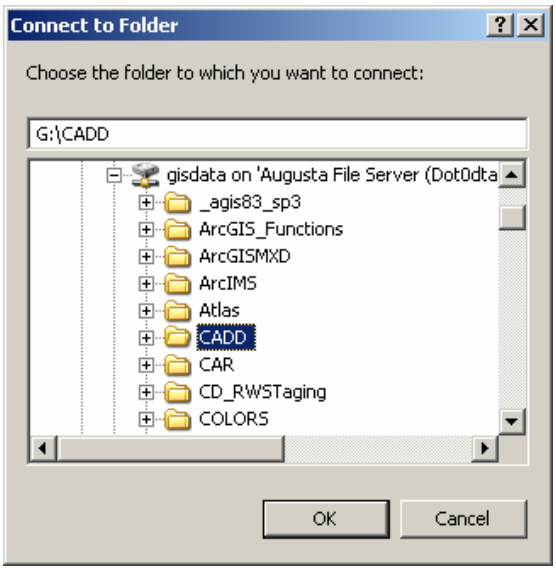


Figure 35-4: Connect to Folder dialog box.

Now you should see the connection alphabetically in your list of files and folders within ArcCatalog (Figure 35-5).

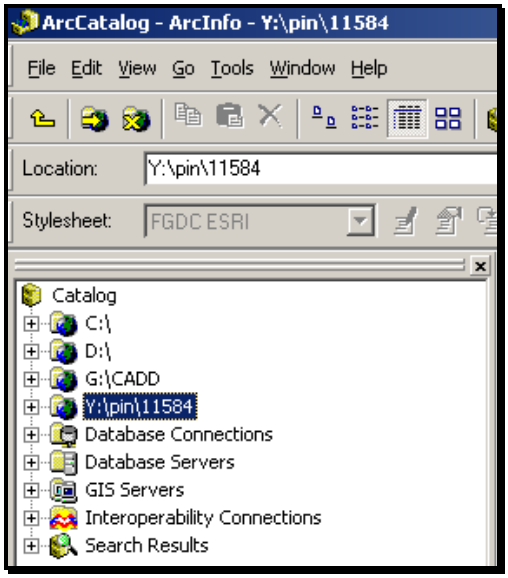


Figure 35-5: Connected folders in ArcCatalog

COPY PREDEFINED GEODATABASE TEMPLATES

Overview

We have created three predefined Geodatabases for use with our CADD files. Two of the Geodatabases contain Feature Datasets with spatial extents for our common coordinate systems we use for CADD data. The difference is one uses Metric units and the other uses U.S. Customary units. The third Geodatabase is for the UTM zone for the state of Maine (NAD83_UTM_19N_Meters). Since most of the GIS world maps data using the UTM datum, we will project our data into this Geodatabase's Feature Dataset. From there, the data can be re-projected into any coordinate system in any units. Likewise, we can take UTM data from the GIS world and *project* it back into the State Plane Coordinate system for all MaineDOT projects.

Step One: Open ArcCatalog

Start ArcCatalog by using your desktop icon.

Step Two: Browse to G: drive

In ArcCatalog's *Catalog Tree,* browse to **G:\CADD.**

Step Three: Copy MaineDOT's UTM Geodatabase

There should be 3 MDOT Geodatabases at this location. Right click the *MDOT-NAD83_UTM_19N_Meters* Geodatabases and select **Copy.** Browse to your PIN's GIS folder (i.e. Y:\pin\11584\00\GIS). Right click this folder and select **Paste.**

- If you are unable to copy into this folder, it may be because you don't have permissions to the folder. Contact CADD Support and you will be added to the permission group.

Step Four: Copy MaineDOT's State Plane Geodatabase

Determine is your project is in US Customary or Metric units by referring to the Status.rtp or Status.doc file if necessary.

- ✓ ***Refer to page 35-9 for more information on the Status report.***

The units will determine which of the remaining two Geodatabases you will copy into the GIS folder. All new projects will be US Customary but some of the older data is metric. Right click the MDOT-StatePlane_Feet Geodatabase and select **Copy.** Browse to your PIN's GIS folder (i.e. Y:\pin\11584\00\GIS). Right click this folder and select **Paste.**

- If you are unable to copy into this folder, it may be because you don't have permissions to the folder. Contact CADD Support and you will be added to the permission group.

Step Five: Remove Unused Datasets (optional)

The two State Plane Geodatabases contain multiple *Feature Datasets* for all of the possible renditions of the State Plane coordinates for that unit of measure. To keep the size of the

Geodatabase down, right click the *Feature Datasets* that you will not be using and select **Delete** (Figure 35-6). Delete all but the *Feature Dataset* you will be using for your project.

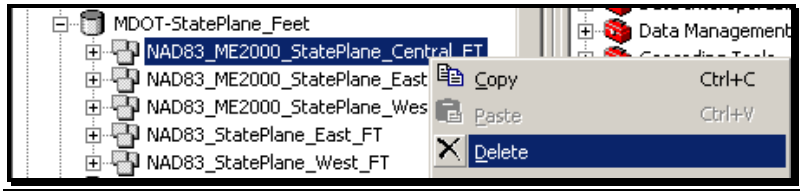


Figure 35-6: Delete unused Feature Datasets.

Verification Process

The Geodatabases can be used as a verification tool as you work with the CADD data. Each Geodatabase has a map of the state (metwp24) as a Feature Class. Use ArcMap to map the data and visually see that your data is in the correct town. If the data is re-projected, check it against the map in new Feature Dataset.

ADD SPATIAL REFERENCE TO CADD DATA

OVERVIEW OF SPATIAL REFERENCE AND CADD FILES

What CADD Files should be used?

There are only a handful of files in any PIN directory that will be useful for GIS. These are the files that represent the existing ground conditions or proposed conditions. We will never be bringing plan sheets (i.e. 001_RWPlan1.dgn), Cross Sections (069_XSMC10_dr_001.dgn) or Profile Drawings (038_PROFMC10_dr_001.dgn) into GIS. None of the files with a 3 digit prefix are spatially located. Instead, select files like alignments.dgn, bridge.dgn, highway.dgn, topo.dgn, text.dgn, RWPlan.dgn, etc. These files can be laid on the face of the earth.

Coordinate System of MaineDOT CADD Data

MaineDOT has used a variety of State Plane coordinate systems throughout the years. In order to use data from one coordinate system and reference it to another, it's important to know both the source coordinate system and the destination coordinate system. Using *Windows Explorer*, browse to your PIN's Survey/MSTA folder (Survey/MX folder for older projects). In one of these directories there will be a file called **Status.doc** or **Status.rpt.** Open the file (it will be read only). In the document you will find the working units (U.S. Survey Feet or METRIC) and you will find a Control Summary. The Control Summary section holds the coordinate description. Write down the units and the coordinates for this project for future reference (i.e. U.S. Survey Feet & NAD83(1996) 1804 ME2000 WEST Zone).

Methods of Applying Spatial Reference to CADD Files

The CADD files do not have the spatial reference in the file header. In the future they may, but until then, you can apply the *Spatial Reference* to a CADD Feature Datasets manually. There are a few methods of applying spatial reference to CADD data. The latest version of ArcGIS now provides an option to save the .prj file with the CADD dataset. This option works great for one or two files, however, if you plan on adding spatial reference to many files, it might be quicker to try *Option Two.* The *Option Two* method would be to copy the proposed projection file (.prj) into the same directory as the CADD file. Rename the projection file to the same name as the CADD file maintaining the .prj extension. Both of these options will require that you have privileges to the folder that contains the CADD dataset in order to save the .prj to the directory. *Option Three* is using the *Conversion Tools* which now provides the option of adding spatial reference as you're creating the *Staging Geodatabase.* The three methods are described below.

The recommended method would be to copy the CADD files and Geodatabases into the GIS folder of a PIN and use *Option Two.* This way other users will not have to repeat the process, they can take advantage of files already spatially referenced. They can also use the files in the Geodatabases that have been re-projected. CADD GIS permissions are required to do this. Contact CADD Support.

APPLY SPATIAL REFERENCE (OPTION ONE)

Step One: Right Click the DGN (CAD Feature Dataset)

In the list of files, scroll down beyond all the files that start with a 3 digit prefix, right-click the file RWPLAN.dgn and select **Properties…** (Figure 35-7).

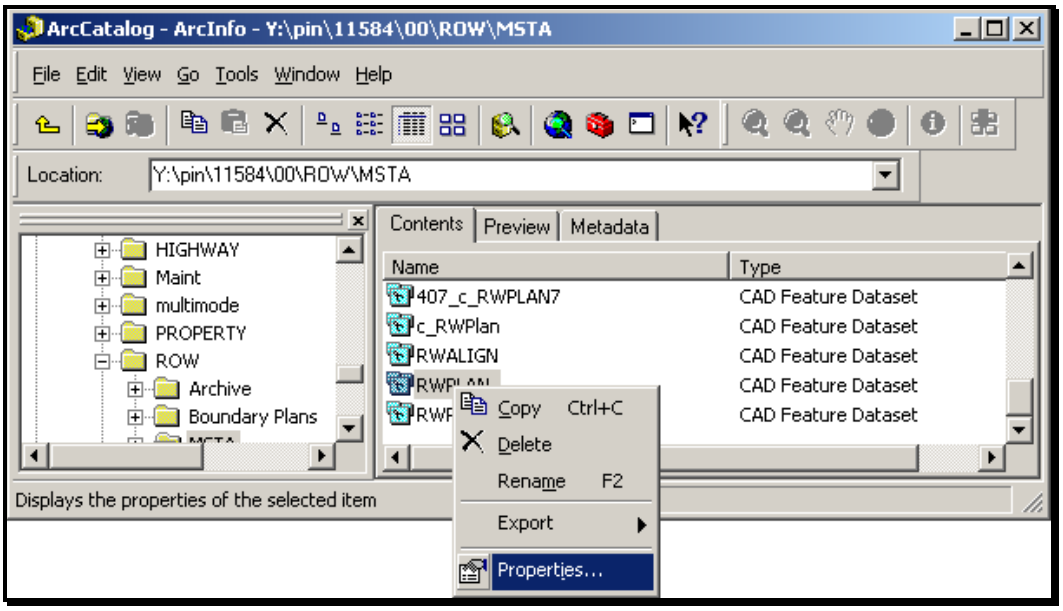


Figure 35-7: Accessing Properties of a CAD Feature Dataset.

When the *CAD Feature Dataset Properties* panel appears (Figure 35-8), notice that the *Spatial Reference* indicates that there isn't a default projection file associated to the CADD file.

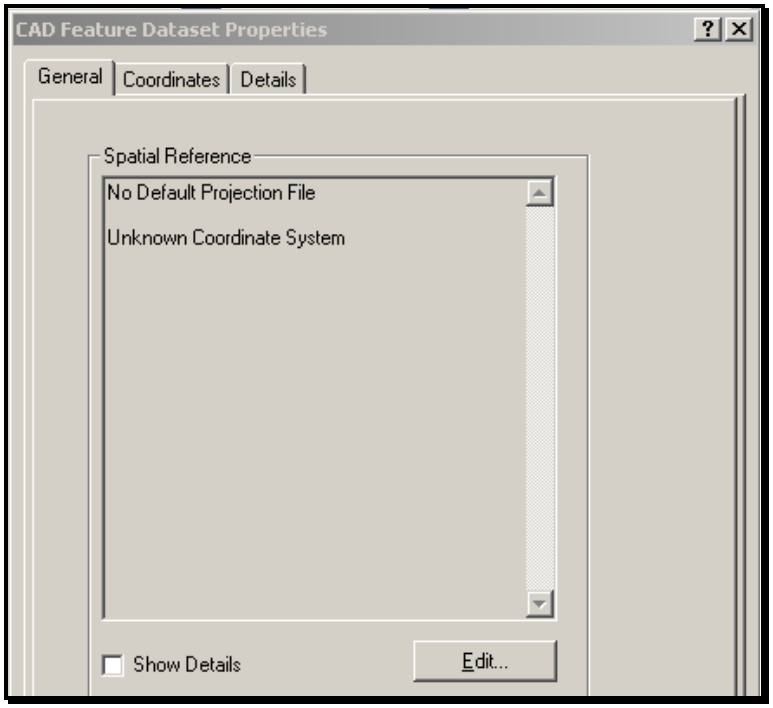


Figure 35-8: CAD Feature Dataset Properties dialog.

Click the **Edit…** button. This opens the *Spatial Reference Properties* dialog (Figure 35-9). Select the **Import** button.

- Another option would be to pick the **Select** button and browse to a projection (.prj) file. We have placed the common projection files within the G:\CADD folder on the network.

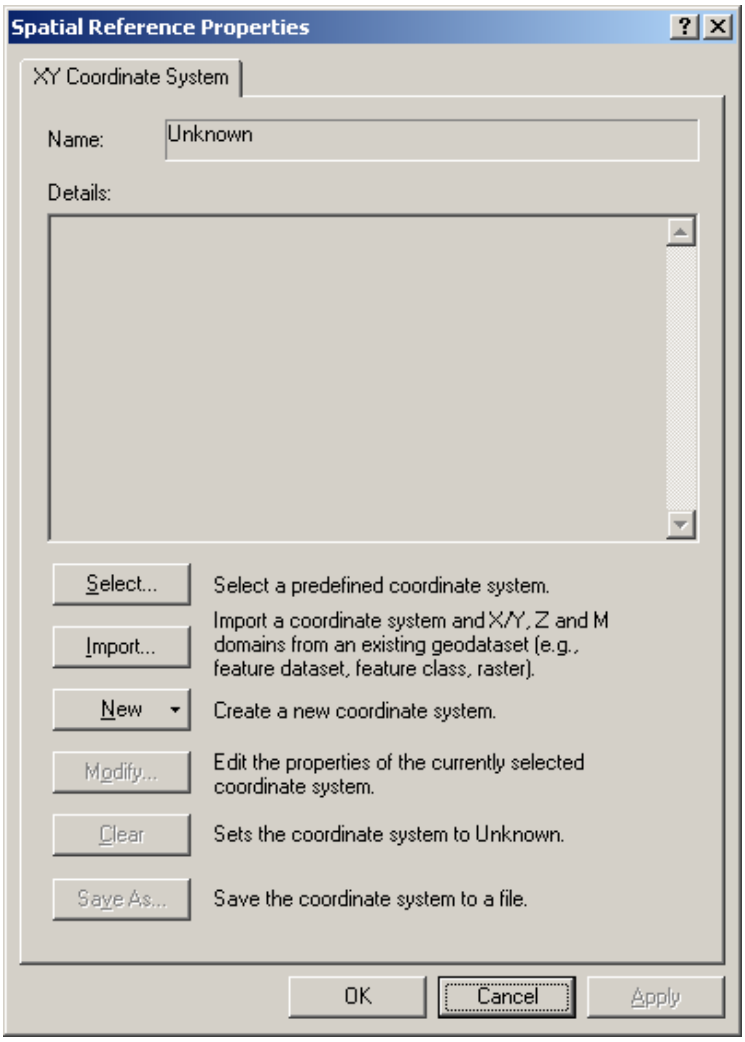


Figure 35-9: The Spatial Reference Properties dialog.

Step Two: Add Coordinate System info to the CAD Feature Dataset

Browse the State Plane Geodatabase within your project's GIS folder. Double click the Geodatabase and select the dataset internally that is named the same coordinate system as your project (Figure 35-10). Click the **Add** button.

✓ ***Refer to page 35-9 for information on determining the coordinate system of your project.***

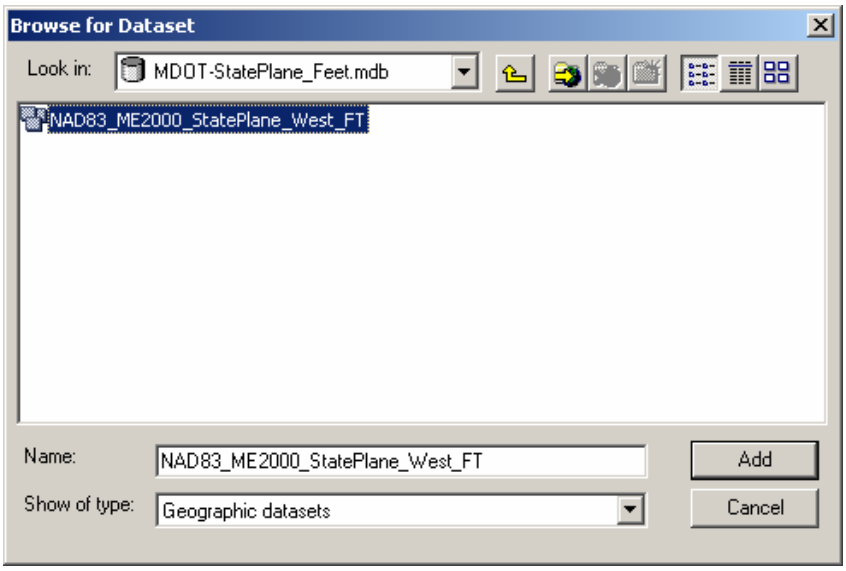


Figure 35-10: Select the Dataset that matches your project's coordinate system.

Then click **OK** at the *Spatial Reference* dialog**.** Next you have an option to **save** a .prj specifically for the file that assigns the coordinate system (Figure 35-11). It's the same name of the original CADD Feature Dataset with the .prj extension. Select **Save.**

ⓘ ***If you do not have permissions to copy the .prj file(s) into the project's MSTA folder, consider copying the files into the GIS folder.***

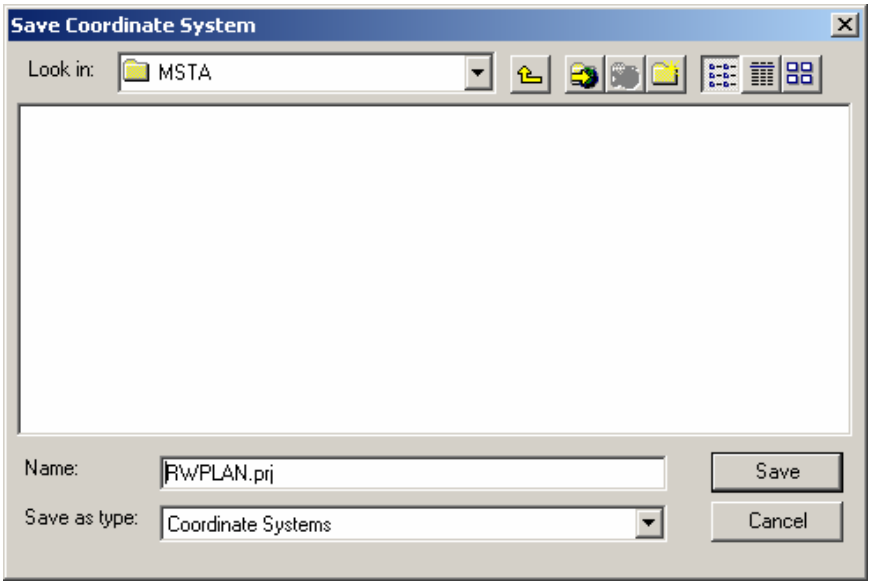


Figure 35-11: Save coordinate system to your files.

Click **OK** to close the *CAD Feature Dataset Properties* dialog.

Step Three: Repeat as Necessary

Adding spatial data need to be done for all CAD drawings that you intend on re-projecting to GIS.

APPLY SPATIAL REFERENCE (OPTION TWO)

Step One: Add .PRJ files to File Directory

Browse to the G:\CADD\Std-filename-projections folder (Figure 35-12). The G: drive is mapped as dot0dta1fsaug01\gisdata.

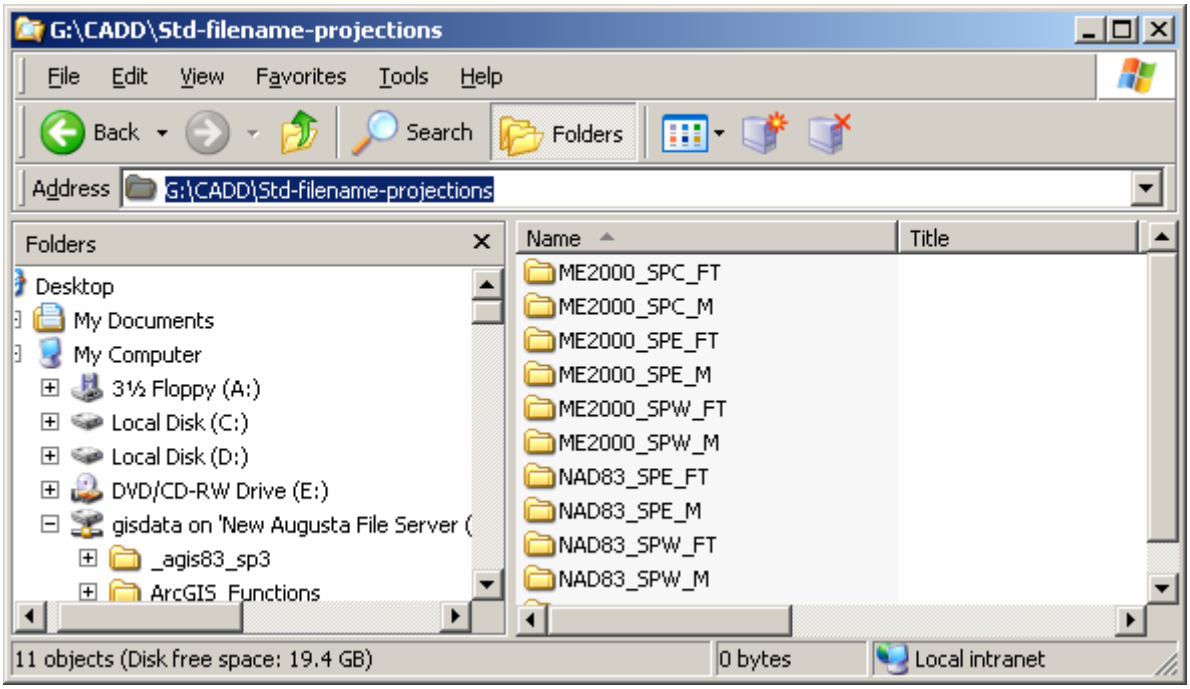
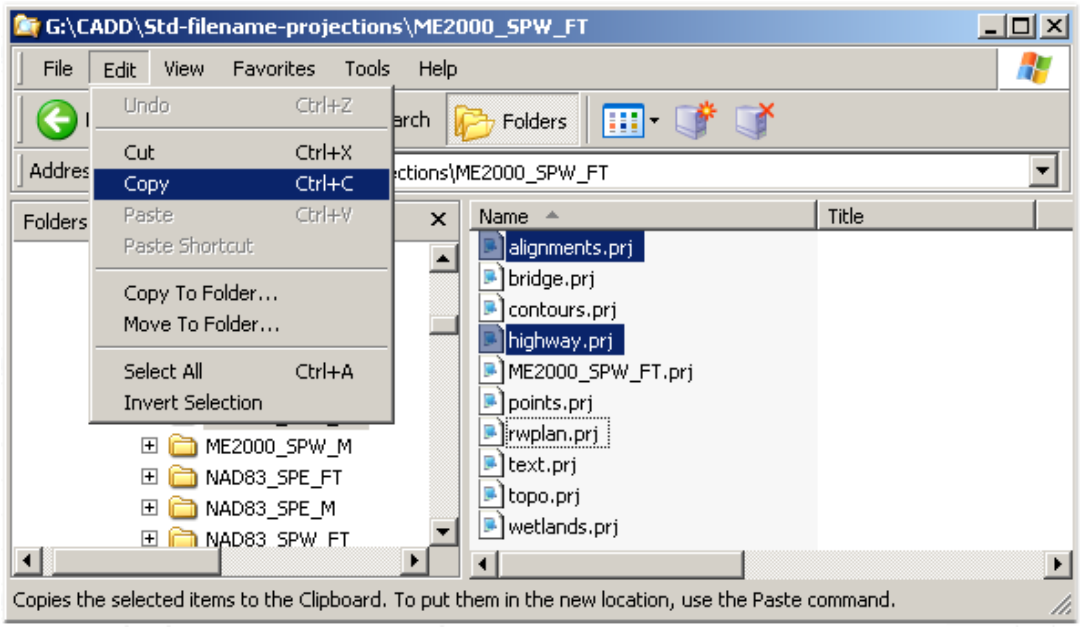


Figure 35-12: The folder containing common file name projections.

✓ ***Refer to page 35-9 for information on determining the coordinate system of your project.***

Step Two: Copy necessary files

Double click on the folder whose name is the same as the coordinate system used for the project. Select the files that you will be re-projecting. Select **Edit>Copy.**



Step Three: Paste the files

Browse to the Y:\pin\#####\## folder and to the workgroup's MSTA folder that contains the dataset (i.e. Y:\pin\11584\00\Highway\MSTA). The Y: drive is mapped as dot0dta1fscadd1\pcpin1. Select **Edit>Paste.**

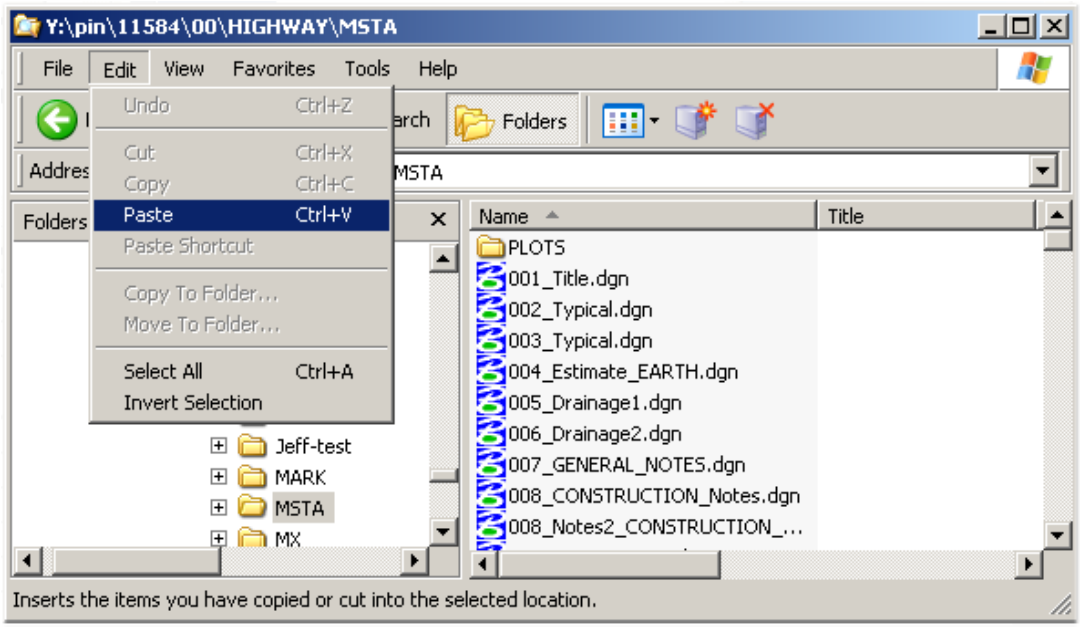


Figure 35-13: Project's folder on the Y: drive.

ⓘ ***If you do not have permissions to copy the .prj file(s) into the project's MSTA folder, consider copying the files into the GIS folder. Contact CADD Support for assistance.***

APPLY SPATIAL REFERENCE (OPTION THREE)

Overview

This method is done on the fly while using the *ArcToolbox>Conversion Tools>To Geodatabase>Import From CAD.* It doesn't require that you have permissions to the directory that contains the CADD data. Steps are described below.

- Be aware that this method of applying spatial reference doesn't maintain connectivity to the CADD data. It would need to be applied again for another instance.

IMPORT CAD DATA INTO GEODATABASE

Overview

ArcCatalog separates a CADD drawing into 5 different groupings; Annotation, MultiPatch, Points, Polygons and polylines. When *Importing From CAD to Geodatabase*, we will be selecting just the just the CAD Feature Dataset.

- At this point, the annotation class doesn't display the text, it displays points that represent the origin of the text. The actual text has to be handled differently in order to get the sizing, font and rotations to come in correctly. This will be dealt with later.

Step One: Copy Geodatabase to PIN's Subfolder (if not already done)

✓ ***Refer to page 35-6 for complete instructions on copying the Geodatabases into the GIS folder.***

- You will need to have permissions to this folder. Contact CADD Support personnel.

Step Two: Import From CAD to Geodatabase

Select the *ArcToolbox>Conversion Tools>To Geodatabase>Import From CAD* tool (Figure 35-14).

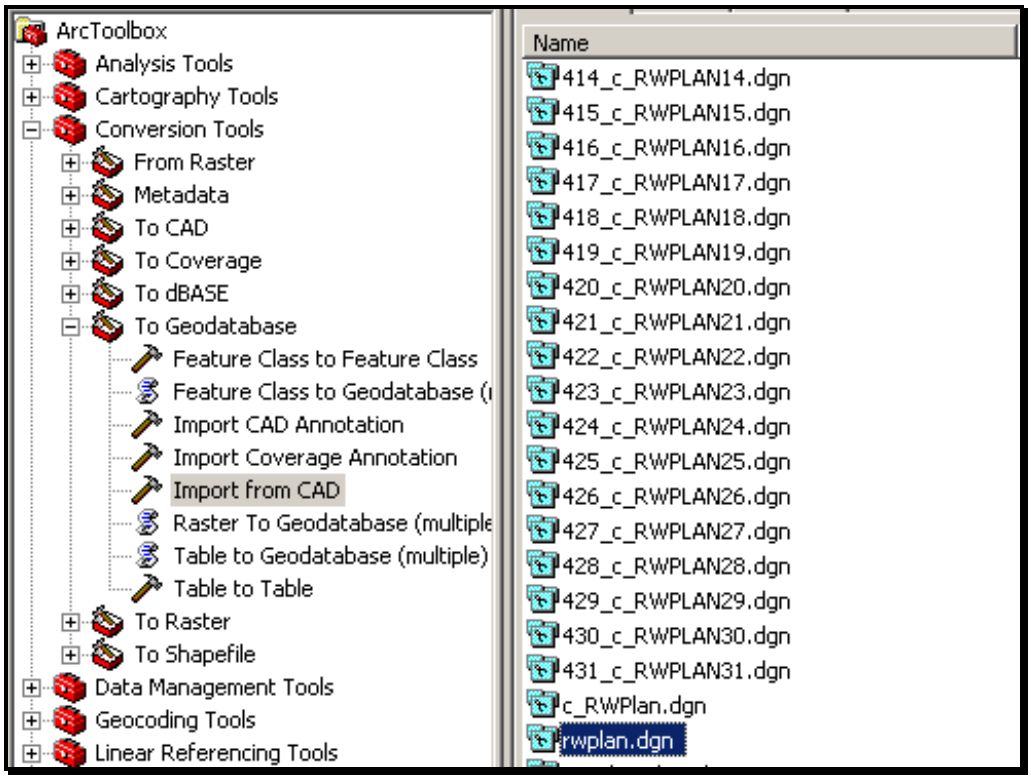


Figure 35-14: Select the ArcToolbox>Conversion Tools>To Geodatabase>Import From CAD tool.

Step Three: Browse to CADD Feature Dataset

Select *Browse* button next to the *Input Files* field (Figure 35-15).

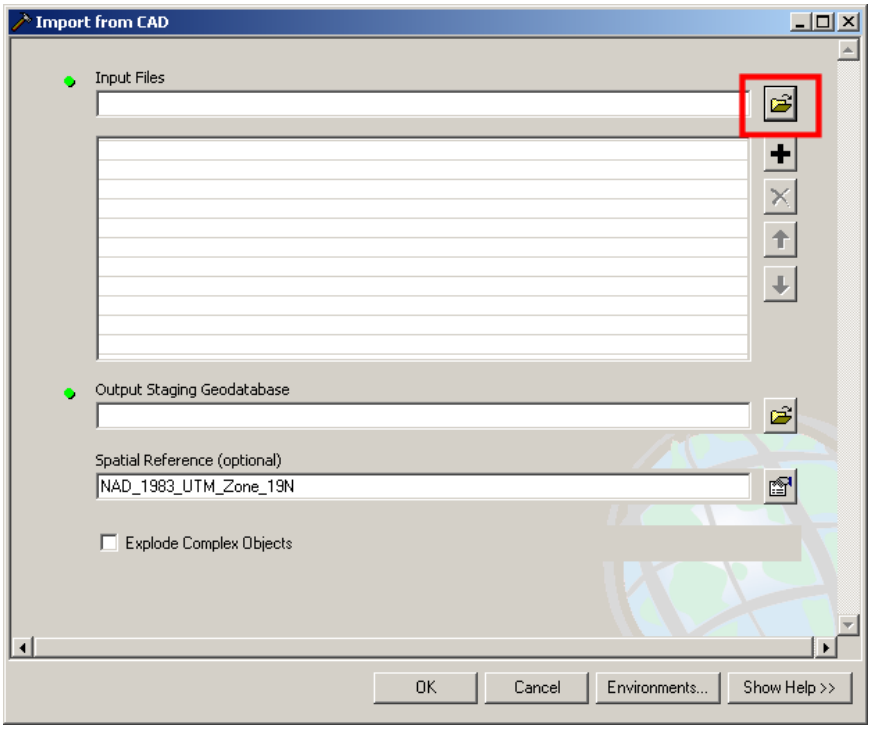


Figure 35-15: Import from CAD dialog.

Locate the CAD Feature Dataset by browsing to your PIN's workgroup/MSTA folder that contains the data needed in GIS (Figure 35-16).

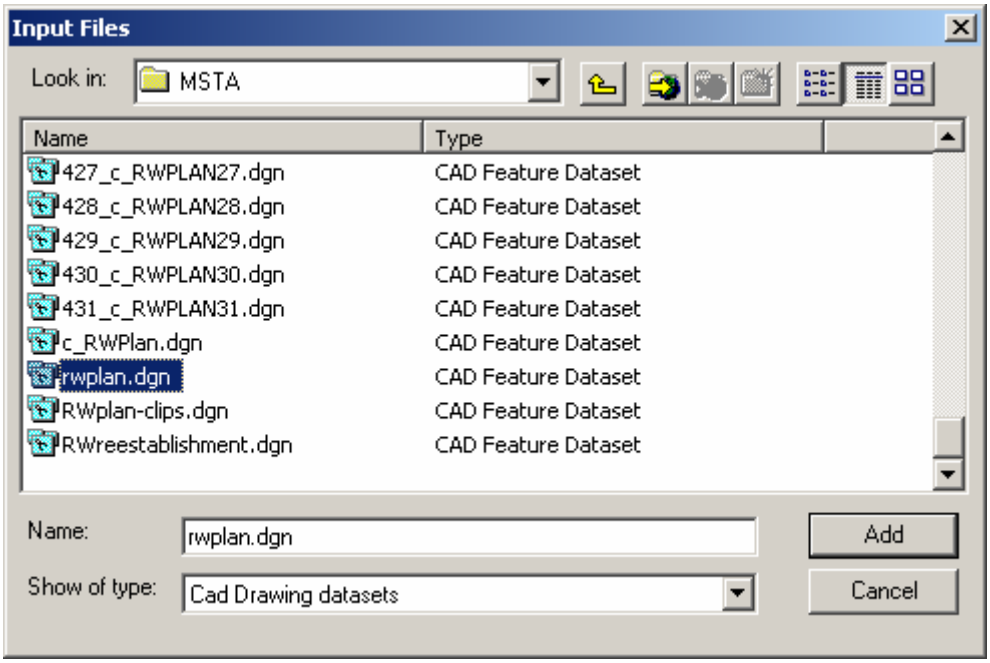


Figure 35-16: Browse to the CAD Feature Dataset needed in GIS.

Step Four: Output Staging Geodatabase

Accept the *Output Staging Geodatabase* as is. You can copy and paste the CAD Feature Dataset from the Staging Geodatabase to the UTM Geodatabase once the process is complete to keep all the data within one Geodatabase.

Step Five: Add Spatial Reference

Depending on whether or not you added spatial reference to the CAD files in a previous step, this field may or may not be correct. This spatial reference will be the State Plane Coordinate System of your project, **not** the intended coordinate system you are projecting to.

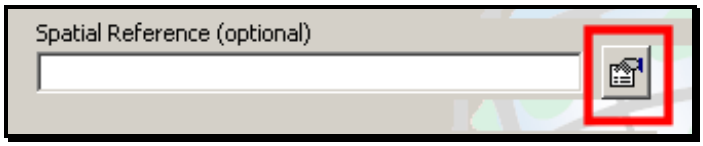


Figure 35-17: Select the Browse button next to the Spatial Reference field.

Select the Browse button next to the Spatial Reference field. Click the **Select** button, browse to the G:\CADD folder and select the State Plan coordinate projection file that is unit and zone specific (Figure 35-18). Select **Add.** Click **Apply** at the *Spatial Reference Properties* dialog.

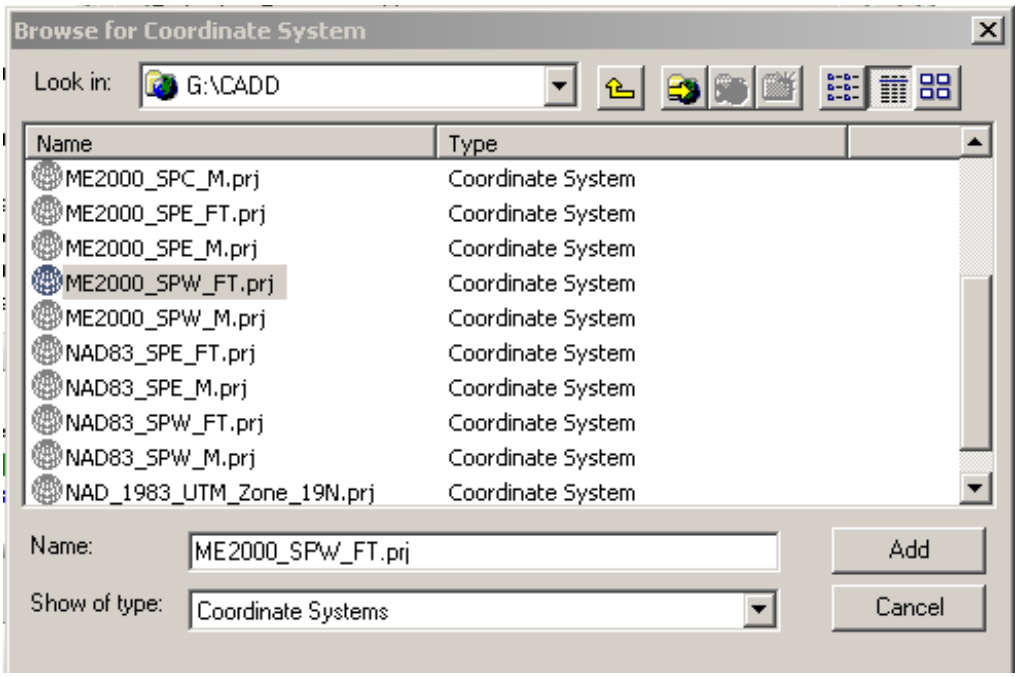


Figure 35-18: Select the coordinate system of the CADD data.

Step Six: Uncheck Explode Complex Objects

It is recommended that you uncheck this feature. This pertains to cells within the .dgn. If a cell is made up of many elements, it will leave it intact and place it at its insertion point in the file as opposed to breaking it apart into multiple elements.

Step Seven: Adjust Environments

Select the *Environments* button. In the *General Settings*, set the *Output Coordinate System* to **As Specified Below.** Select the Browse button next to the Spatial Reference field. Click the **Select** button, browse to the G:\CADD folder and select the NAD_1983_UTM_Zone_19N.prj file. Select **Add.** Click **Apply** at the *Spatial Reference Properties* dialog. Click **OK** in the *Environment Settings* dialog.

Step Eight: Process the File

Click **OK** at the *Import From CAD* dialog. At this point, ArcCatalog will show you the progress and report on the status of each imported Feature Class. If you receive red text in the progress box, it indicates that there have been errors processing the data. If the error indicates that there are some elements that do not fit spatially, there may be actual elements that inadvertently got placed outside of the zone (either in NH or in the ocean). Opening the MicroStation file and doing a fit view may show the elements that are outside of the drawing area. If this is found, the elements should be deleted.

Once the process is complete, you should see a message like the one below (Figure 35-19).

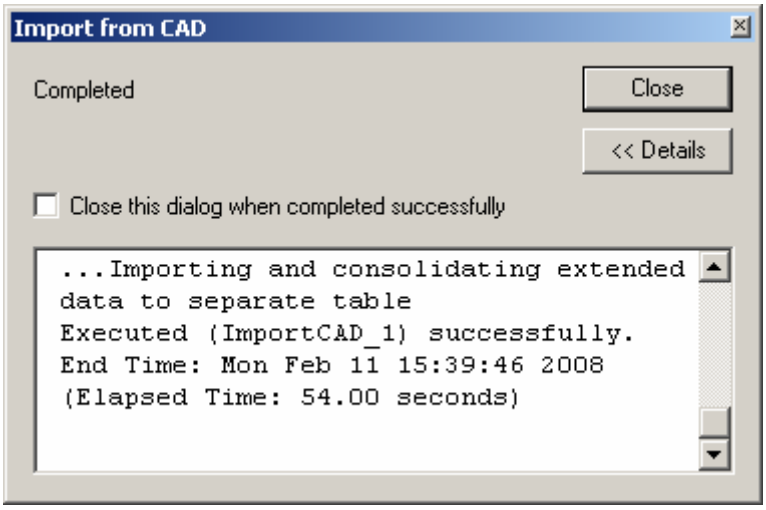


Figure 35-19: Completed dialog once the data has been processed.

Step Nine: Verify by Mapping the Data (Optional)

Now you can verify that your project has been projected into the UTM (metric) coordinate system. Start ArcMap and create a new map. Select the **Add Data** icon and browse to your Geodatabase in your PIN folder. Double-click the Geodatabase and select your Feature Dataset. Click the **Add** button.

The Geodatabase has a map of the state as one of its default Feature Classes so when the map is displayed, you should see your data (points only while zoomed out). If you zoom in on the data, more details will become visible. Verify that it falls in the correct town or city by selecting the “i” for the information tool and click in the shaded polygon that encompasses the project. The information box should display what town your project is in.

- Depending on the order you added the data, you may have to move the Map to the bottom of the list in ArcMap.

Troubleshooting

There seems to be some trouble with the latest version of ArcGIS with the MicroStation CAD feature datasets. If everything seems to process but no data is present, consider opening the MicroStation file and saving it as an AutoCAD file (.dwg) and trying it again. The interoperability with AutoCAD currently provides better results. If you've added a projection file to the directory and name the file the same, ArcCatalog will pick up on the projection of the file.

CREATING A FEATURE CLASS FOR ANNOTATION

Overview

When creating annotation for CADD data, you need to treat the annotation and dimensions separately from the line work. ArcToolbox has a conversion tool that handles the text very well. The steps that follow will instruct how use this tool.

For best results, follow the process outlined below. First add the annotation into the Geodatabase setup with the original coordinates and units of the project. Then right click and Export to the UTM Geodatabase or other proposed coordinate system. This gives better control over the text size.

Step One: Open ArcToolbox

Select the *ArcToolbox* icon or by selecting **Window>ArcToolbox** from the main menu. Expand the *Conversion Tools* category. Select the *To Geodatabase* grouping.

Step Two: Import CAD Annotation

Select the Import CAD Annotation tool.

Step Three: Browse for Annotation Feature Class

Select the Feature Class to import by browsing to the workgroups/MSTA folder that contained the original CAD Feature Datasets. Open the Feature Dataset (i.e. rwplan.dgn). It should contain an Annotation Feature Class identified by a blue icon with the letter "A" on it. Select the *Feature Class.* Click **OK.**

- Each and every drawing file that gets exported to the UTM Geodatabase will need to have the text brought over as well (if is necessary).

Step Four: Browse for Output Feature Class Location (State Plane)

Select the **Browse** button next to the *Output Feature Class* field and browse to your project's GIS folder on the y: drive. Double click the Geodatabase (i.e. MDOT-StatePlane_Feet) and to the *Feature Dataset* that resembles the coordinates and units of your project (i.e. NAD83(1996) 1804 ME2000 WEST Zone).

Supply a name for the Annotation Feature Class. Use a logical name that is similar to the other feature classes for that same drawing (i.e. rwplan_dgn_text). Use underscores instead of hyphens. Select **Save.**

Step Five: Add a Reference Scale

In this step, enter **300** as a scale value.

Step Six: Create Class from Levels

There already should be check in this checkbox by default. If there isn't, add the check. Click

OK (Figure 35-20).

- This will breakdown the text based on the level it is found in. This will give more flexibility when mapping the data.

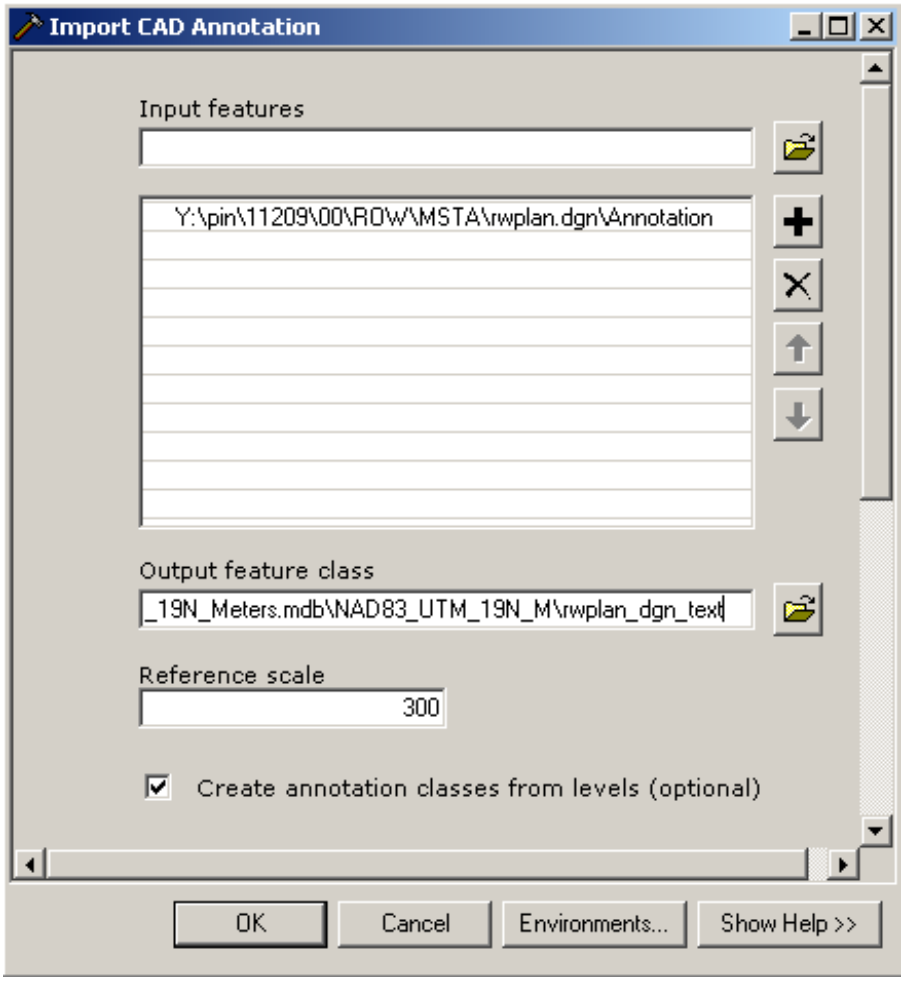


Figure 35-20: Import CAD Annotation dialog.

Step Seven: Preview Annotation

Using ArcCatalog, browse to your PINs Geodatabase by utilizing the preset connection (Y:\pin\11584). Expand the Geodatabase by hitting the plus (+) sign. Expand the Feature Dataset. Select the annotation Feature Class. On the right side of the dialog, click the *Preview* tab. Use your zoom in tools to look at the data.

Step Eight: Re-Project the Annotation

Right click the *Annotation Feature Class* and select **Export>To Geodatabase (single)** (Figure 35-21).

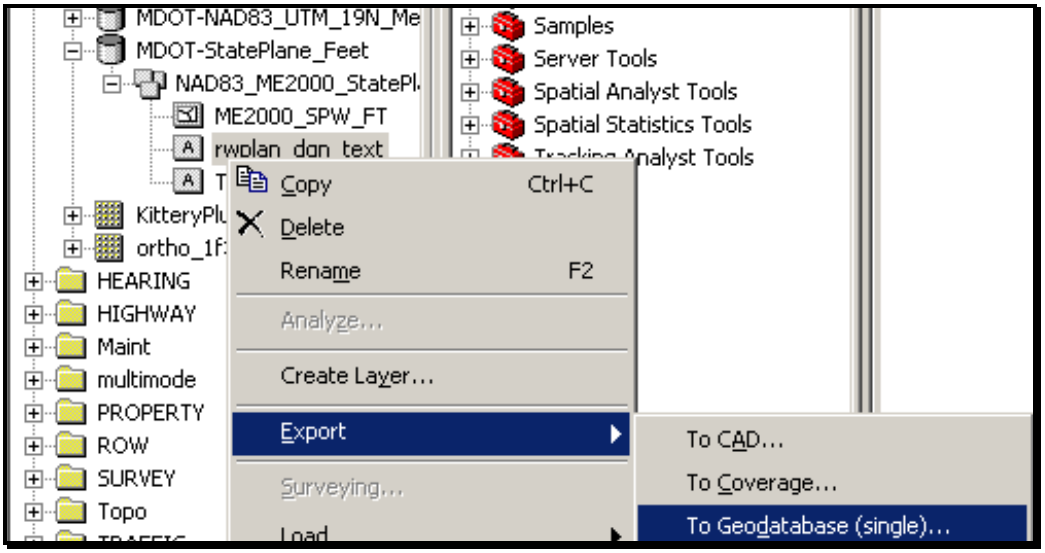


Figure 35-21: Export the Annotation to another Geodatabase.

Step Nine: Set Output Location and Name

In the *Feature Class to Feature Class* dialog, select the browse button next to the *Output Location* field and browse to the UTM Geodatabase located in the GIS folder of your project. Double click the Geodatabase and select the UTM *Feature Dataset* (Figure 35-22). Click **Add.**

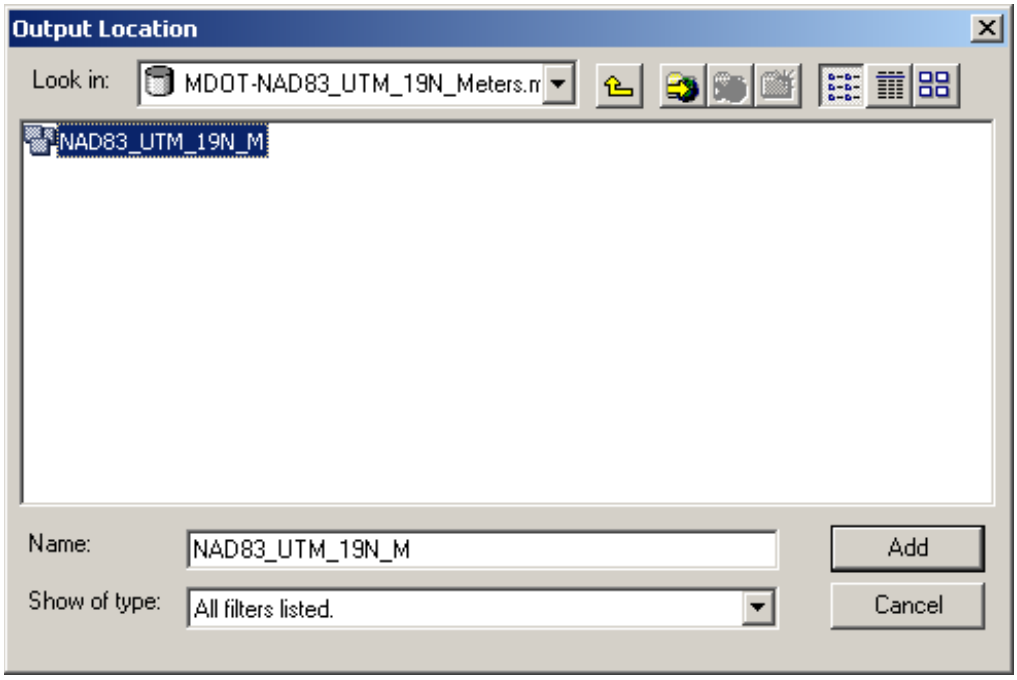


Figure 35-22: Browse to the UTM dataset for an output location.

In the *Output Feature Class* field, supply the same name that was supplied earlier (i.e. rwplan_dgn_text). This will create a *Feature Class* with the same name in both Geodatabases.

Verify by Mapping the Data

You can verify that your project has been projected into the UTM (metric) coordinate system by starting ArcMap and creating a new map. Select the **Add Data** icon and browse to your UTM Geodatabase in your PIN's GIS folder. Double-click the Geodatabase and select your Feature Dataset. Click the **Add** button. If the annotation lines up with the rest of your data then you are done or repeat as necessary with the remaining Annotation Feature Classes.

UTM DATA TO STATE PLANE COORDINATES

DOWNLOAD AERIAL PHOTOGRAPHY (RASTER IMAGES)

Overview

Raster images come in a variety of formats with various compressions. The most important thing to know about the image is its *Spatial Reference.* Knowing this will enable the image to be re-projected to another known coordinate system. Without this information the image will have to be placed manually and will require moving and rotating to best fit with the CADD data. The following portion of the document will describe retrieving an image from the MEGIS website with the *Spatial Reference* of NAD83_UTM_19N (meters) and re-projecting the image to State Plane coordinates of NAD83(1996) 1804 ME2000 WEST Zone (feet).

Step One: Browse to MEGIS Website

MEGIS is a good location to get aerial photography, but it may not be the most recent images available and the quality can vary depending on the area of the state. As long as the image has *Spatial Reference*, this documentation will work.

Open an Internet Browser and enter http://megis.maine.gov. On the left portion of the page, select **Maps** (Figure 35-23).

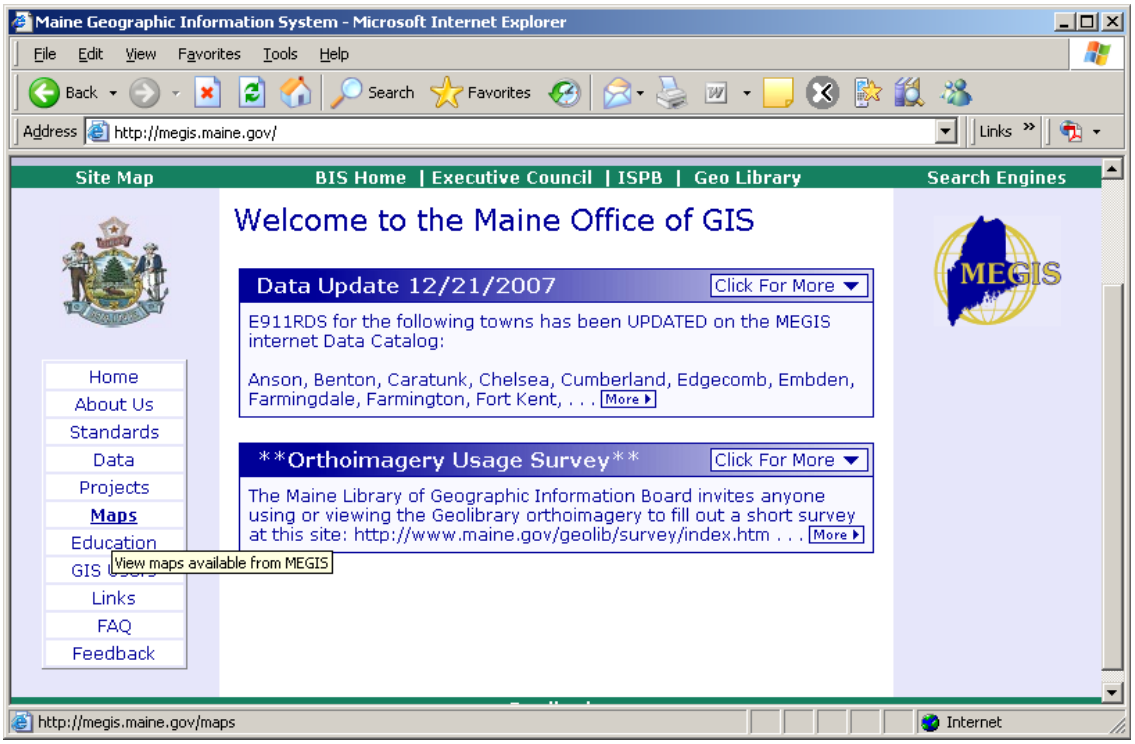


Figure 35-23: MEGIS webpage.

Step Two: Open Aerial Photography Viewer

Select the **Aerial Photography Viewer** under the *Interactive Online Maps* heading. When the new page loads, close the welcome screen (Figure 35-24).

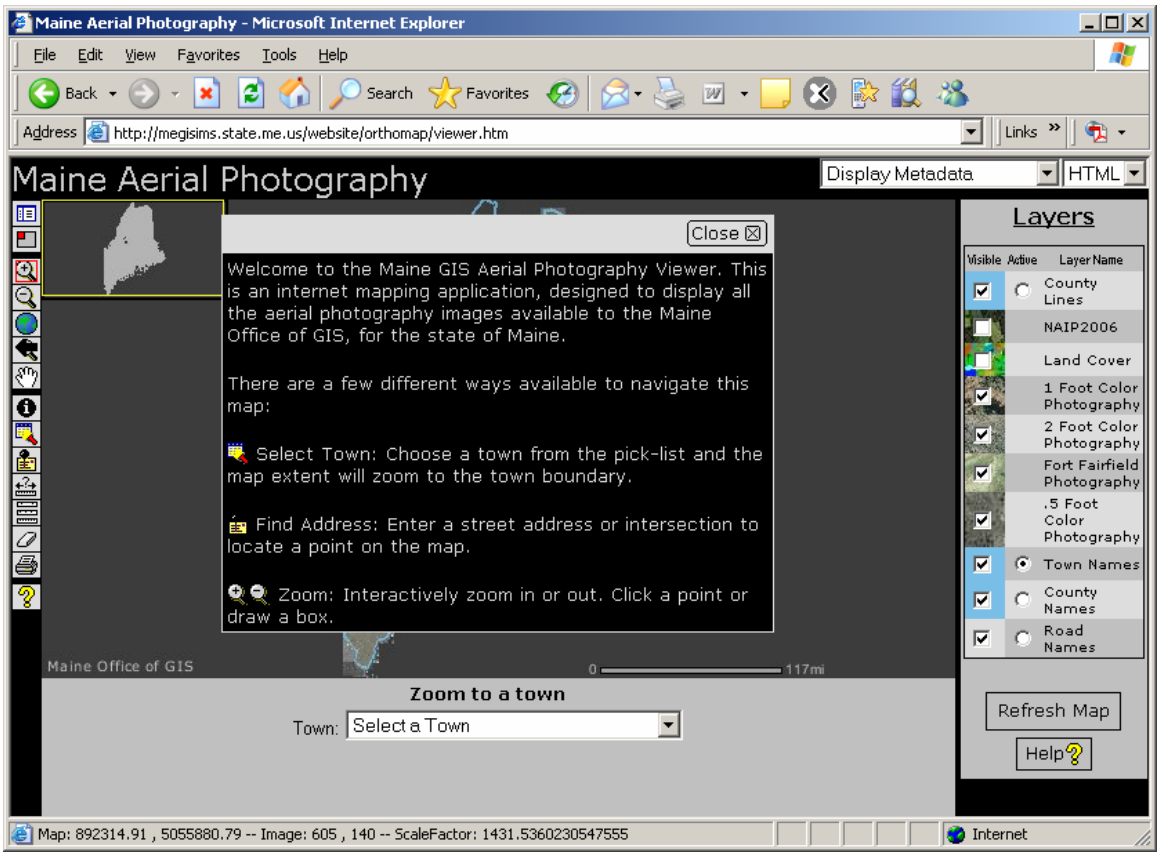


Figure 35-24: Maine Aerial Photography Viewer welcome page.

Step Three: Select a Town

Using the pull down at the bottom of the map (Figure 35-25), select the town you are interested in (i.e. Kittery).

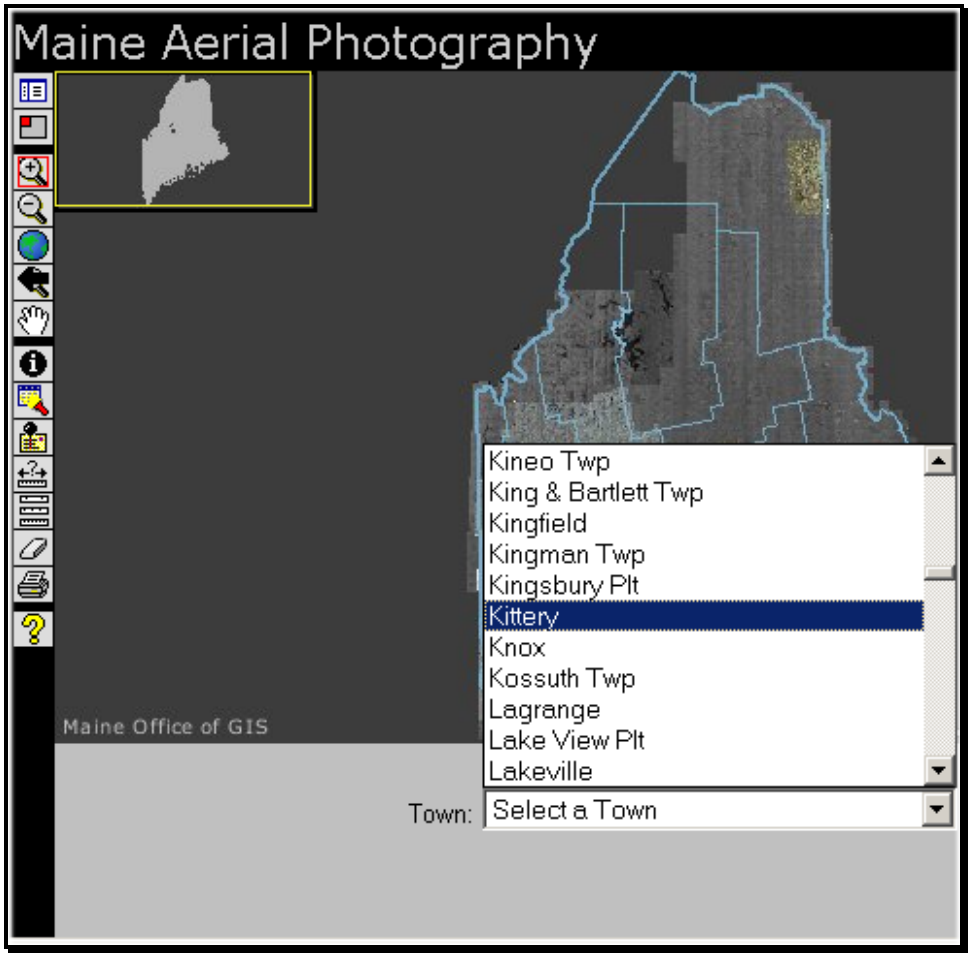


Figure 35-25: Select a town from the Zoom to town pull down.

Step Four: Adjust the Legend and Active Layer

Overview

This step will determine the quality of image that is available for the town. In the *Legend* portion of the dialog, you will need to experiment by "checking" and "un-checking" the *Visible Layers* that control the viewing Color Photography on the map.

Part One: Test for Highest Quality

Start by un-checking all but the *Town Lines, .5 Foot Color Index, .5 Foot Color Photography, Town Names and Road Names.* The highest quality image available will be the **.5 Foot Color Photography.** If this quality is available, you should see color map and a grid representing "tiles" that are available for download (it may require zooming in or out a bit). If no grid displays and the map is black and white, check for Next Highest Quality.

Part Two: Test for Next Highest Quality

Uncheck the *Visible Layers* .5 Foot Color Photography and .5 Foot Color Index and place a check in the **1 Foot Color Index** and the **1 Foot Color Photography** for the next

highest quality images. Now there should be a grid of “tiles” that are available for download (it may require zooming in or out a bit) and a color map. If this isn’t available, try the 2 Foot Color Photography which is less desirable.

Part Three: Set the Active Layer

Make the highest quality **Color Index** *Active* by placing a dot in the “radio” button next to the index (i.e. 1 Foot Color Index) as seen in Figure 35-26.

Figure 35-26: Layers set to the highest quality image currently available for the town of Kittery.

Step Five: Download the Image(s)

Part One: Click on the Tile

Select the *Identity* tool in the toolbar (Figure 35-27). Click anywhere within a “tile”.

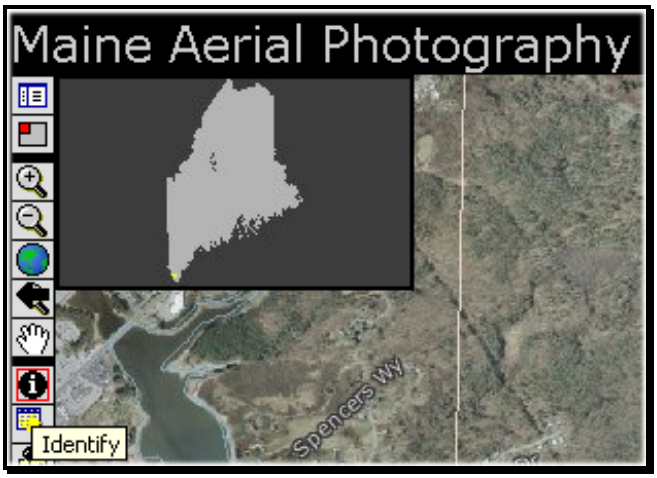


Figure 35-27: Identify tool represented by the letter "i".

This will display some image information at the bottom of the map (Figure 35-28) including the date and a link to the image.

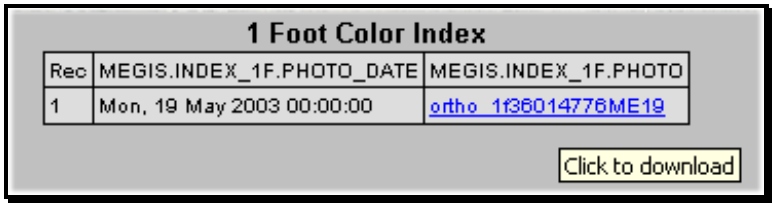


Figure 35-28: Click link to download the zip file.

Part Two: Download the Image(s)

Click the link to download and save the image that's in the form of a zip (compressed file). Select **Save** and browse to the desired location (Figure 35-29). The recommendation is to the GIS folder within your project's PIN directory on the Y: drive (i.e. Y:\pin\11584\00\GIS). Repeat for all tiles needed.

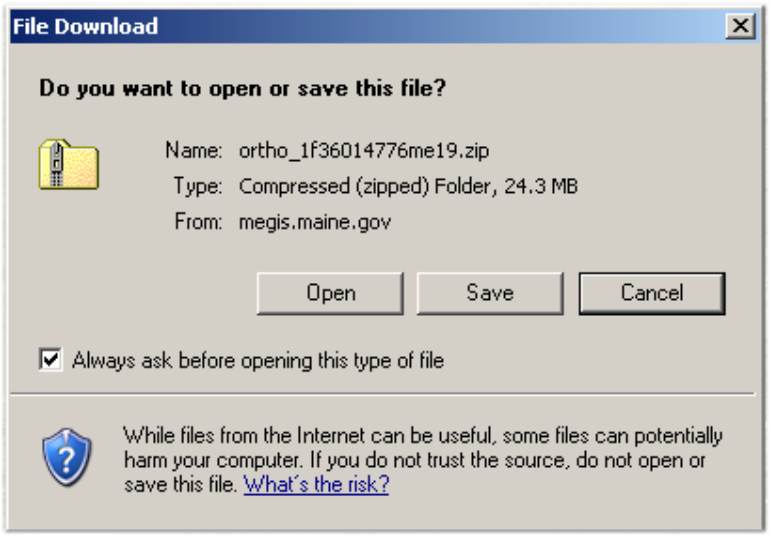


Figure 35-29: Save the zip file to the desired location.

Part Three: Extract Images

Open *Windows Explorer* and browse to the image location. Extract the images by right clicking the zip file and selecting **Extract all** (Figure 35-30). When the *Extraction Wizard* dialog appears, click **Next.**

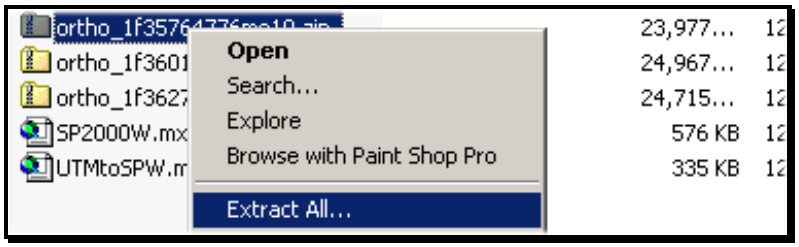


Figure 35-30: Right click and select Extract All.

Clicking **Next** again (Figure 35-31) will extract the image(s) into folder(s) that are named the same name as the original zip file(s). Click **Finish** when the extraction is complete.

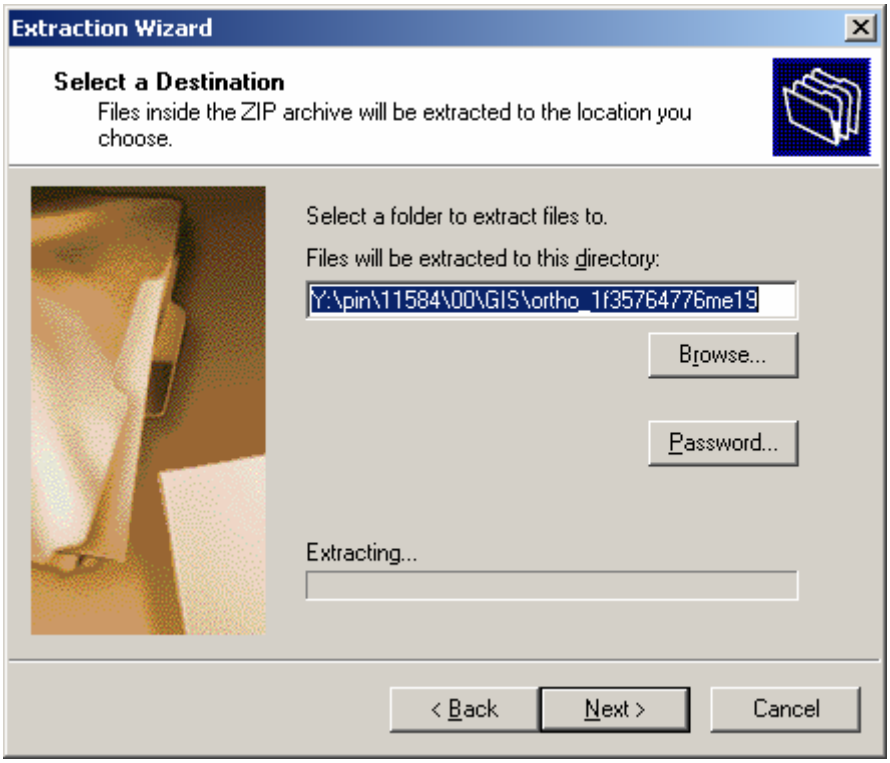


Figure 35-31: Extraction Wizard ready to extract to new folder.

RE-PROJECT AERIAL PHOTOGRAPHY

Overview

This next process requires that you have ESRI (GIS) software installed on your PC. It's also helpful to setup connections the data.

Step One: Open ArcCatalog

Open ArcCatalog. Setup a connection to the location of the images (i.e. Y:\pin\11584).

- ✓ ***Refer to page 35-3 for detailed information on setting up connections within ArcCatalog.***

Step Two: Open ArcToolbox

Click the **ArcToolbox** icon from the *Standard* toolbar within ArcCatalog (Figure 35-32).

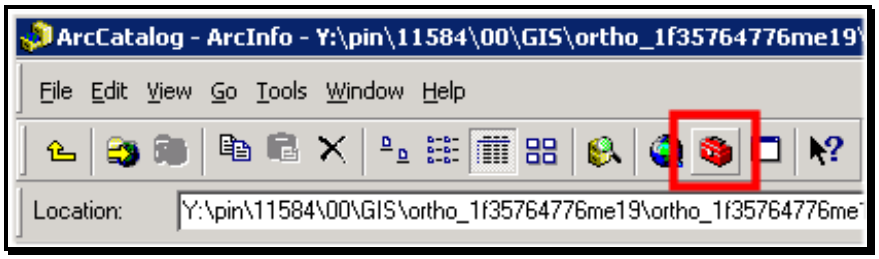


Figure 35-32: Click the ArcToolbox from the Standard toolbar.

Step Three: Open Composite Bands Tool

Expand the **Data Management Tools** to expose the **Raster>Composite Bands** tool (Figure 35-33). Double Click this tool.

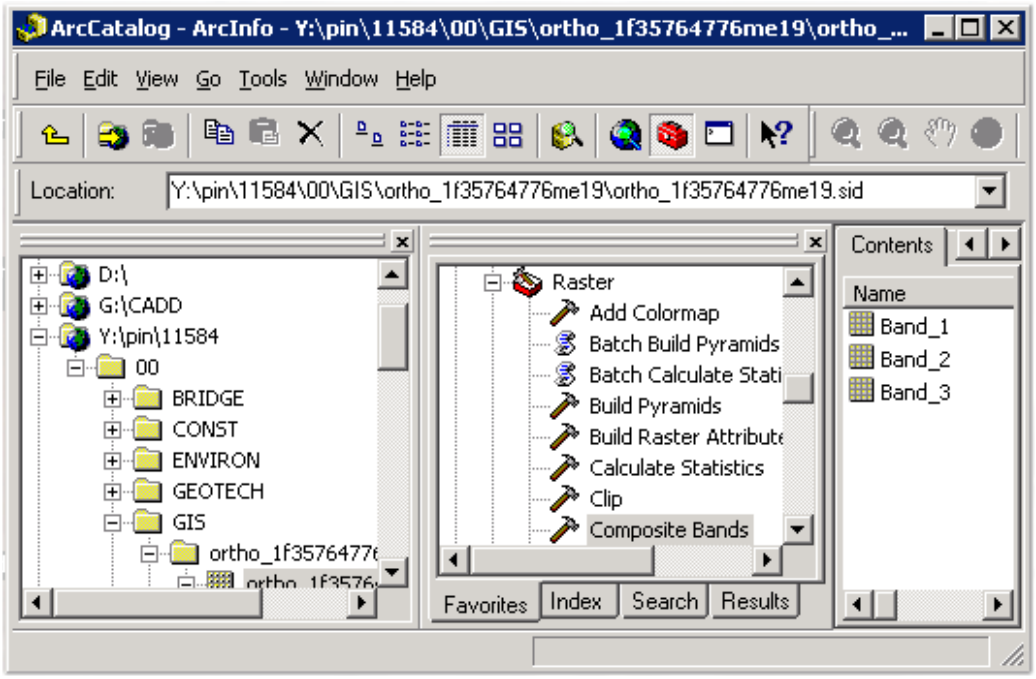


Figure 35-33: Composite Bands tool within ArcToolbox.

Step Four: Select Raster Bands

Browse to the location of the raster image (i.e. Y:\pin\11584\00\GIS\ortho_1f35764776me19). Double click the image displaying its bands. Select the image's Bands and click **Add** (Figure 35-34).

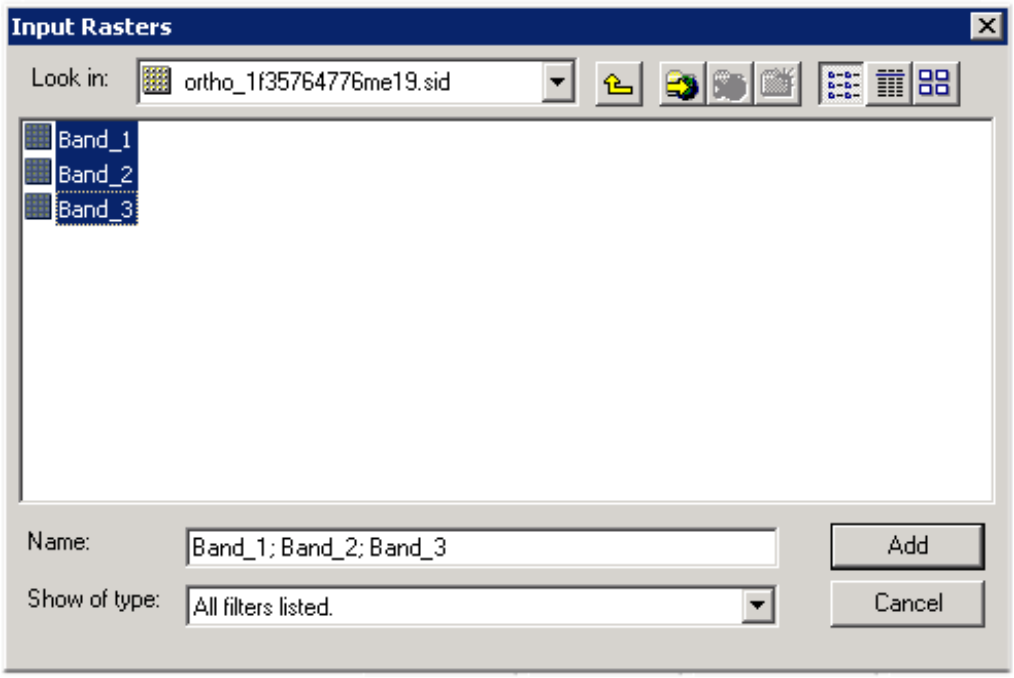


Figure 35-34: Browse to the image.

Step Five: Adjust Output Raster

Adjust the *Output Raster* by stripping the name down to the original raster name followed by a **.tif** file extension (Figure 35-35).

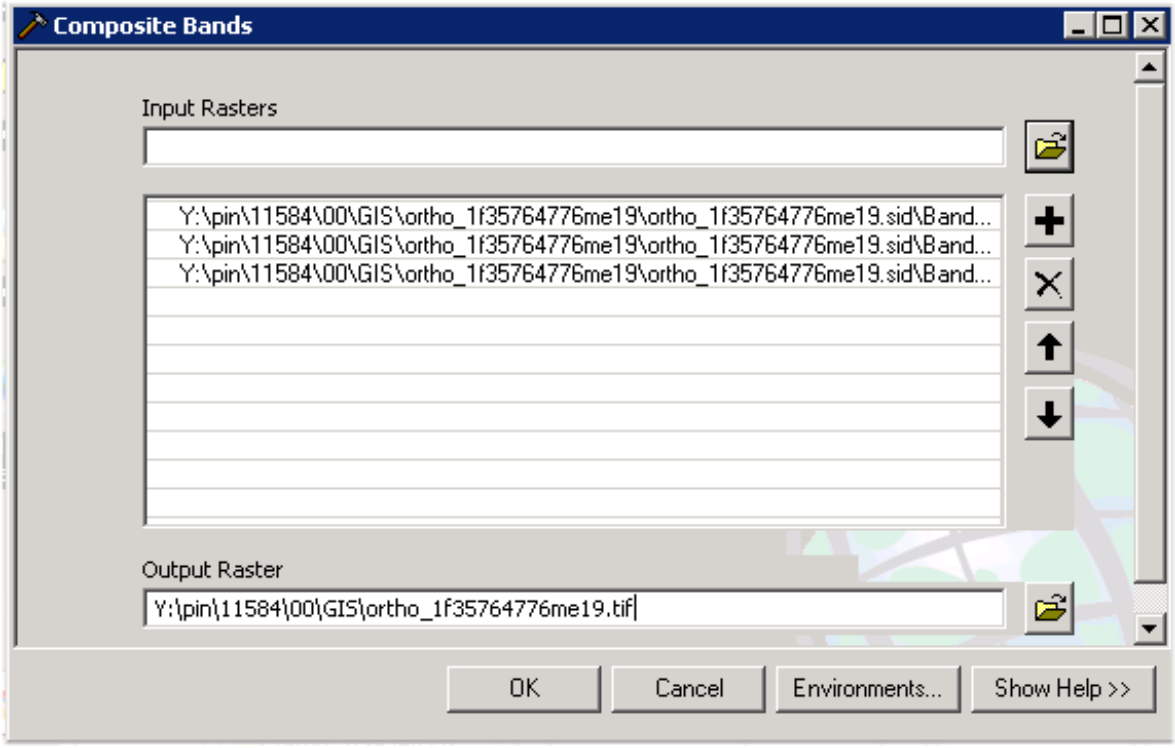


Figure 35-35: Adjust Output Raster name and location.

Step Six: Adjust Environments…

Click the **Environments** button. Adjust the following settings:

Part One: General Settings

Under *General Settings*, change the **Output Coordinate System** to **As Specified Below.** Click the *Browse* button (Figure 35-36).

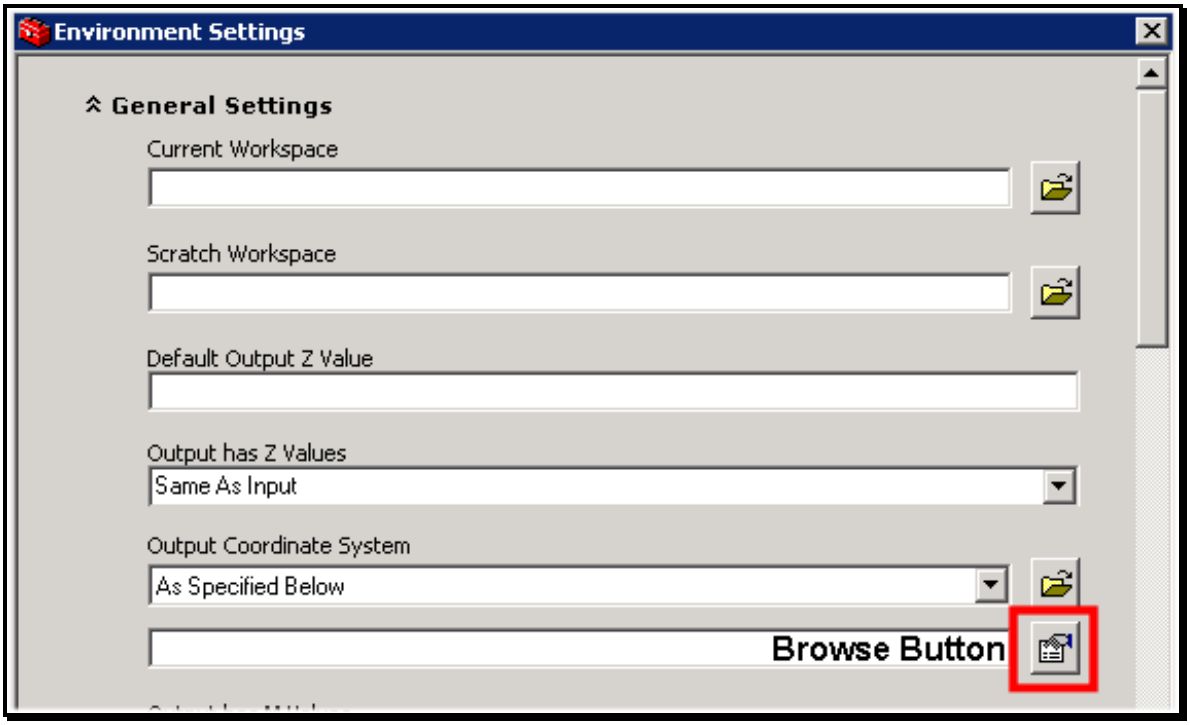


Figure 35-36: Click the Browse button.

Select the **Import** button and browse the State Plane Geodatabase within your project's GIS folder. Double click the Geodatabase and select the dataset internally that is named the same coordinate system as your project. Click the **Add** button. Click **OK.** The result should be the proposed coordinate system (Figure 35-37).

- Another option would be to pick the **Select** button and browse to a projection (.prj) file. We have placed the common projection files within the G:\CADD folder on the network.

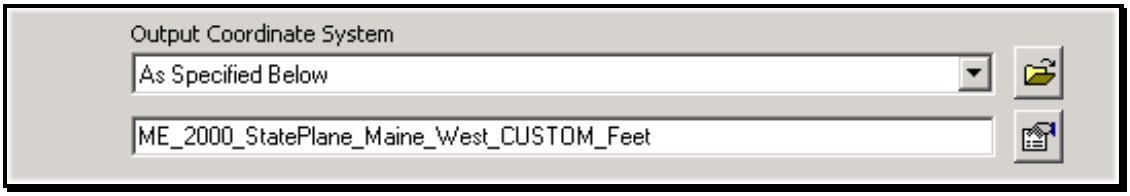


Figure 35-37: The result will be the desired output coordinate system.

Part Two: Adjust the Raster Storage Settings

Scroll down the **Environments** settings and expand the **Raster Storage Settings.** Remove the check mark next to the *Build Pyramids* and the *Calculate Statistics.* Change the *Compression* to **None** (Figure 35-38). Click **OK.** Click **OK** again to start the process.

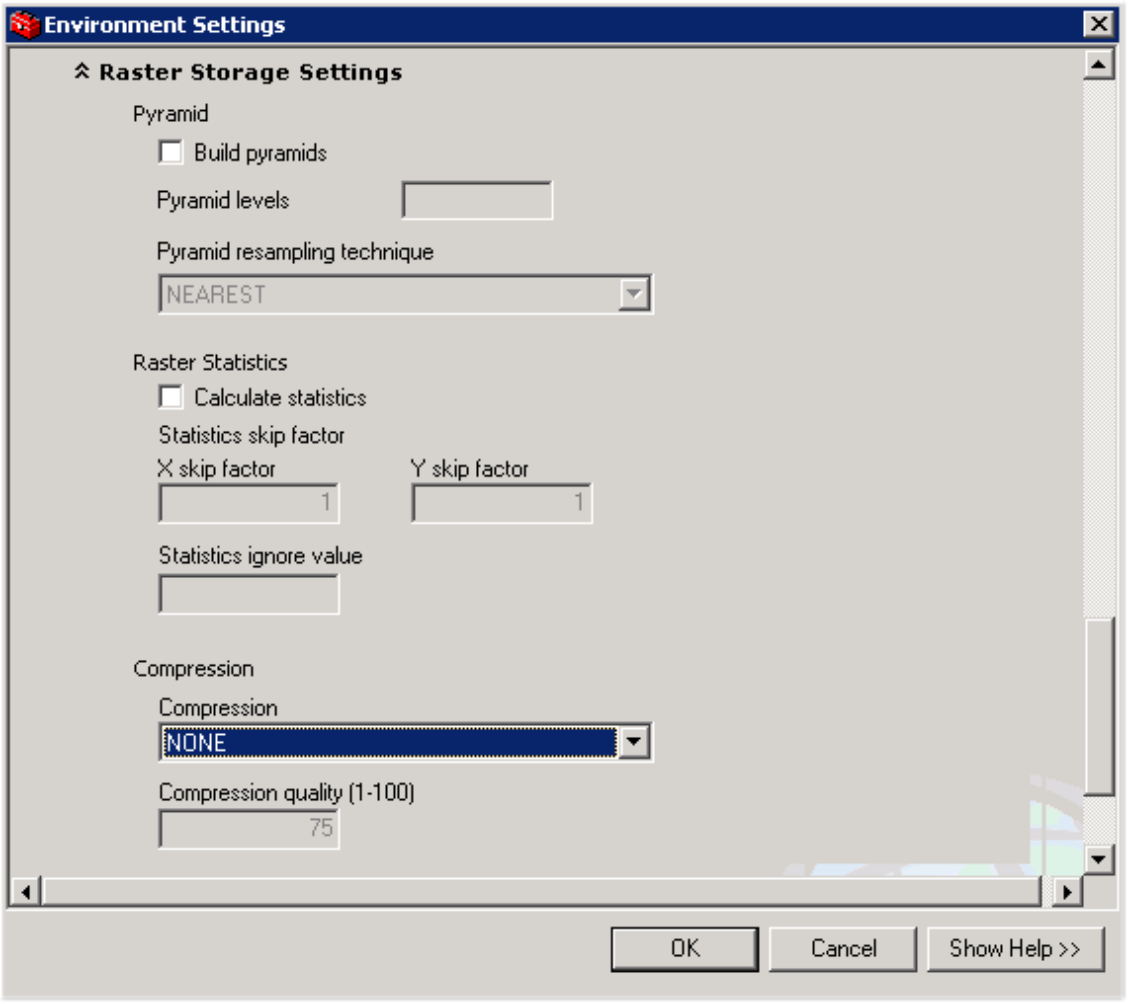


Figure 35-38: Adjust the Raster Storage Settings.

When the process is complete, the dialog will display the *Competed* message (Figure 35-39).

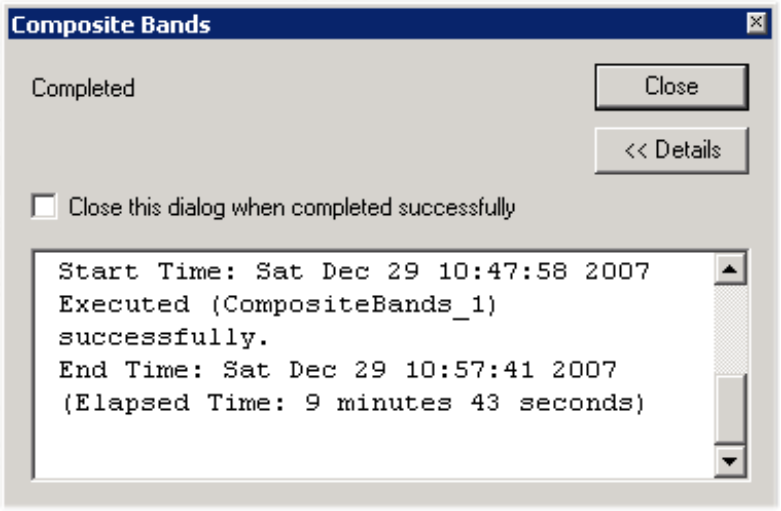


Figure 35-39: Completed message once the process has been completed.

ATTACHING TO MICROSTATION FILE

Step One: Open MicroStation

Launch MicroStation from the Desktop icon. Select the project from the project pull down. Open a file that has relativity to the ground and individual plan sheets (i.e. HDPLAN.dgn, BDPLAN.dgn or RWPLAN-Clips.dgn).

Step Two: Adjust MicroStation Preferences (if necessary)

Open MicroStation. Select **Workspace>Preferences** from the MicroStation main menu. Select the **Raster Manager** *Category*. Adjust the preferences to match the dialog shown in Figure 35-40.

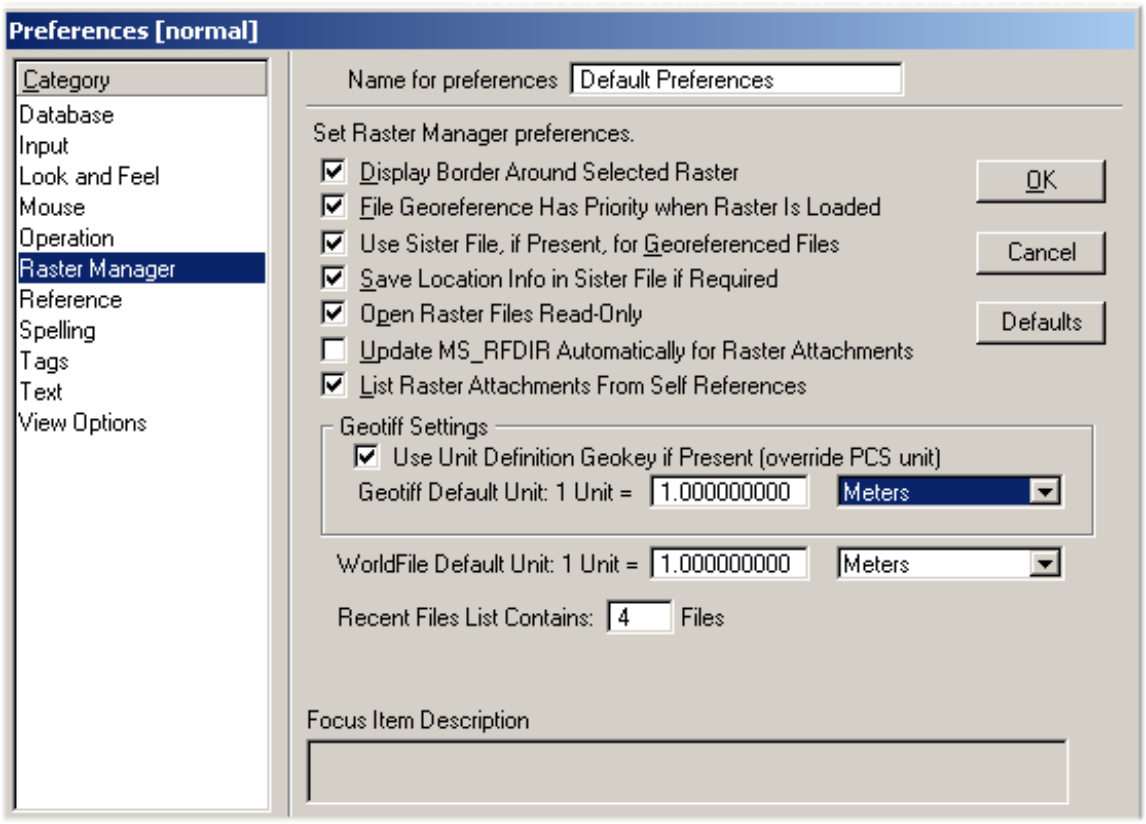


Figure 35-40: Raster Manager preferences adjusted to handle re-projected raster.

Step Three: Import Raster

Select **File>Raster Manager.** Browse to the image within the GIS folder of your project. Select the image. Uncheck the *Place Interactively* option (Figure 35-41). Click **OK.**

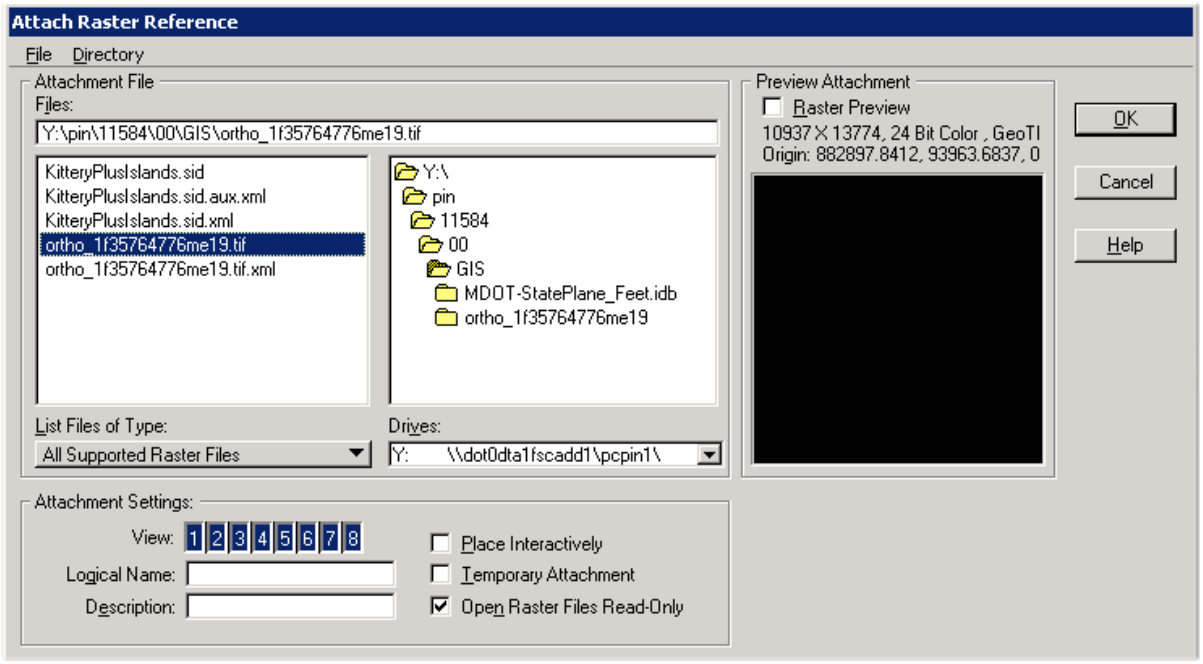


Figure 35-41: Attach Raster Reference dialog.

Repeat as necessary.

Step Four: Adjust Transparency (if Necessary)

If more than one image is used, it may be necessary to adjust transparency of one or more images so that the images match together without a black space between them (Figure 35-42).

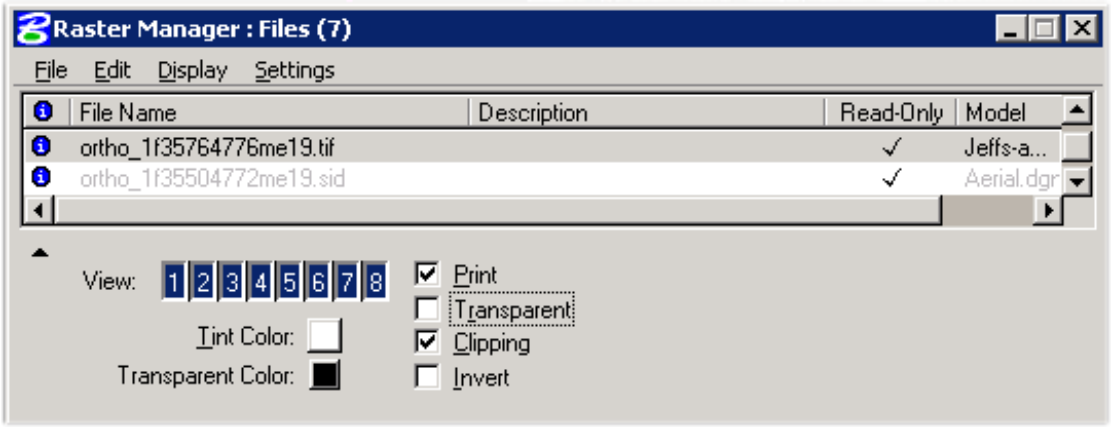


Figure 35-42: Raster Manager with image attached. Transparency unchecked.

EXPORTING UTM DATA TO CADD

Overview

Whether you take the whole GIS layer/feature class/shape file or a selection set of one of these through ArcMap, the process of re-projecting the layer is the same. For best results, the layer should be re-projected into a Geodatabase that contains a *Feature Dataset* at the proposed State Plane Coordinate System and units. Once there, it can be *Exported to CAD* while using the correct MaineDOT's MicroStation or AutoCAD seed file.

GIS data comes from a variety of sources and in a variety of types. ESRI is used to perform the following steps. The most important thing about the data is its *Spatial Extents* or coordinate system. Knowing this will allow the re-projection into the State Plane coordinates for the project.

Step One (Option One) - Using ArcMap

Part One: Select data

If all of the data is currently displayed within ArcMap, and you only want a certain area to be included within the CADD drawing, a new layer can be made. Select the **Select Features** tool in the *Tools* tool box (Figure 35-43). Click opposite corners to make a rectangle crossing the data you want to select. The lines will highlight.

Figure 35-43: Select Features tool on LT and selected features on the RT.

Part Two: Create New Layer from Selection

Create a new layer based on the selection set by Right Clicking the data set and selecting **Selection>Create Layer From Selected Features** (Figure 35-44).

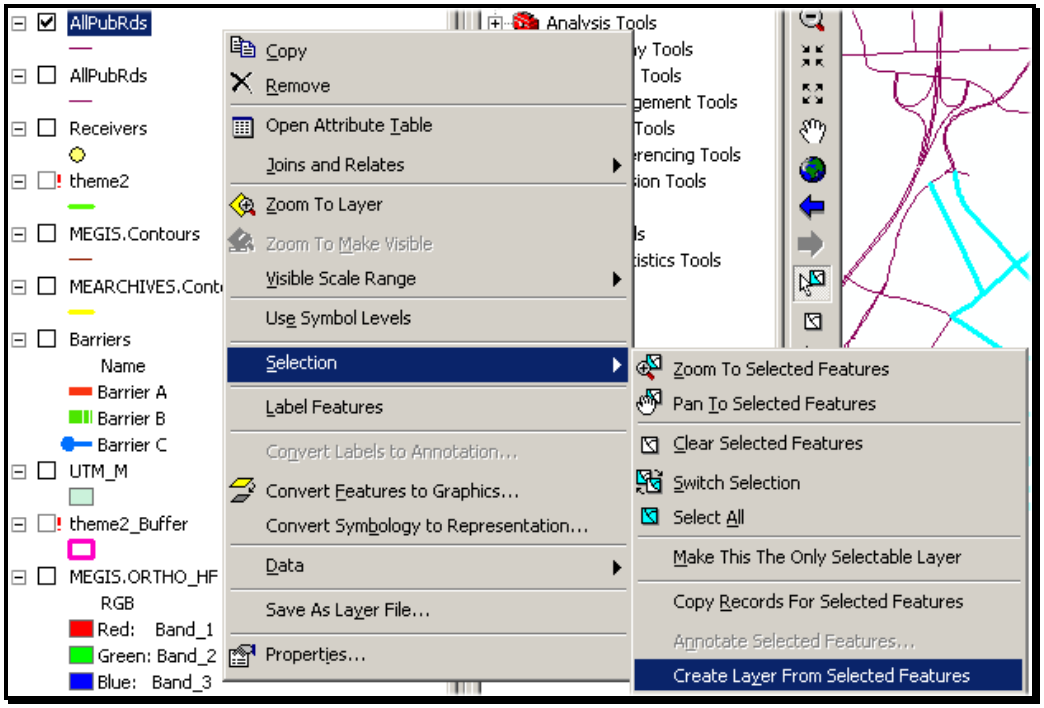


Figure 35-44: Create a new layer from selected features.

Part Three: Send Feature Class to new Geodatabase Feature Class

Select **Conversion Tools>To Geodatabase>Feature Class to Feature Class** tool from the *Arc Toolbox.* Fill in the dialog box with appropriate information (Figure 35-46).

Select the *Input Features* from the pull down.

Select the *Output Location* browse button and browse to the *Geodatabase* that contains the *Feature Dataset* that has been setup for your project's State Plane Coordinate system (Figure 35-45).

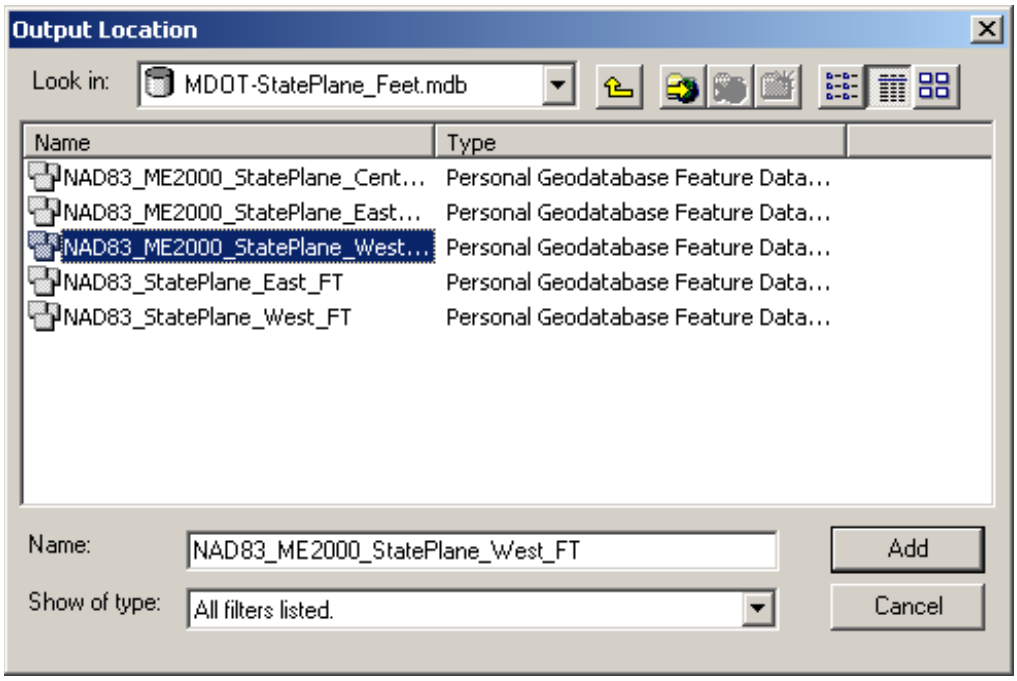


Figure 35-45: Set the Output Location to your Project's Geodatabase Feature Data Set.

Supply a name for the *Output Feature Class.*

The dialog should resemble the one in Figure 35-46. Click **OK.**

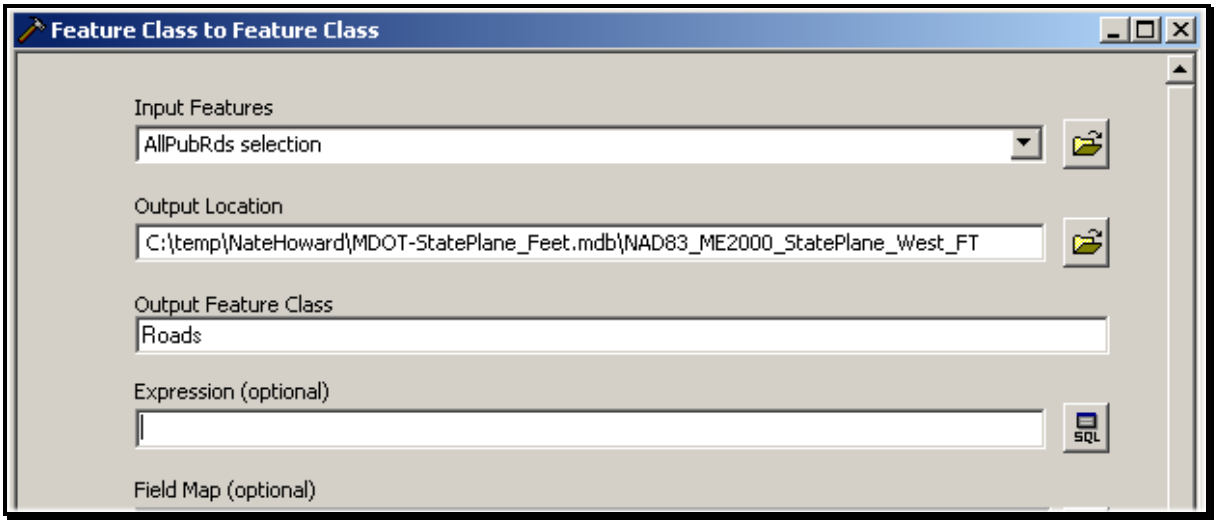


Figure 35-46: Dialog setup with the sample data.

Step One (Option Two) - Using ArcCatalog

Part One: Right Click Data to Export

Open ArcCatalog and browse to the layer to be re-projected. Right click the layer and select **Export>To Geodatabase (single)** (or multiple depending on the data) (Figure 35-47).

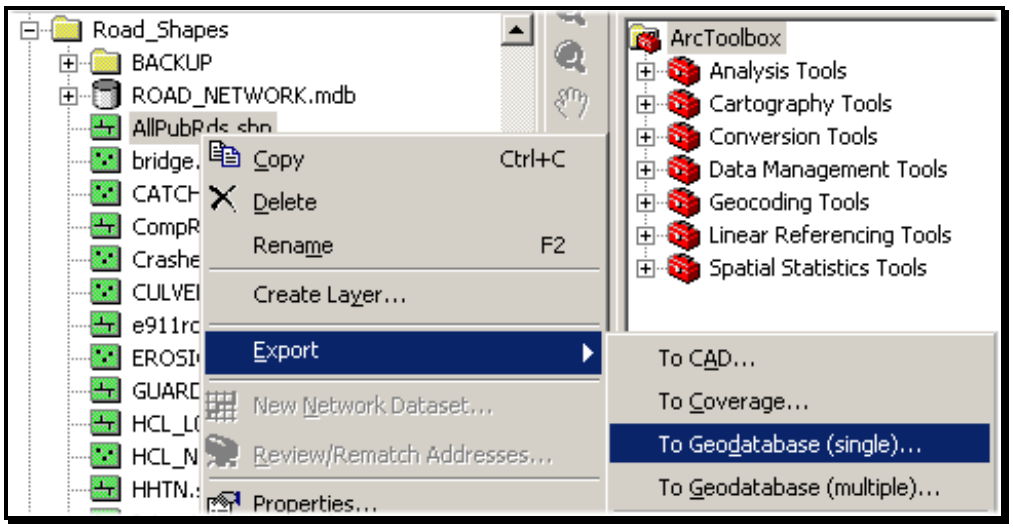


Figure 35-47: Exporting data to Geodatabase.

Part Two: Adjust Feature Class to Feature Class Dialog

Select the *Output Location* browse button and browse to the *Geodatabase* that contains the *Feature Dataset* that has been setup for your project's State Plane Coordinate system (Figure 35-48).

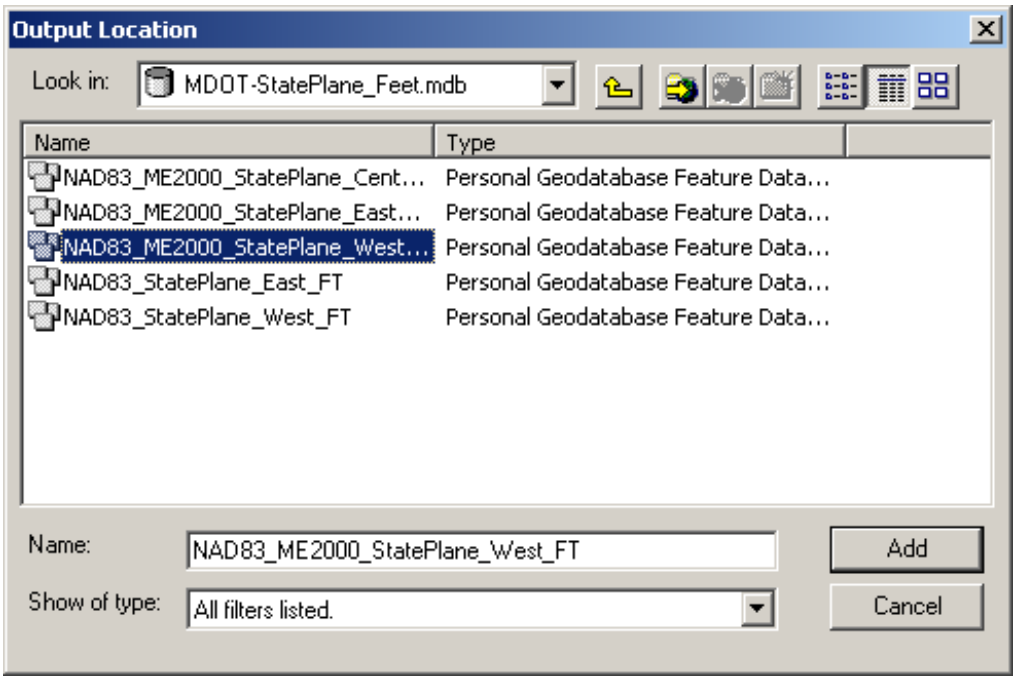


Figure 35-48: Set the Output Location to your Project's Geodatabase Feature Data Set.

Supply a name for the *Output Feature Class.*

The dialog should resemble the one in Figure 35-49. Click **OK.**

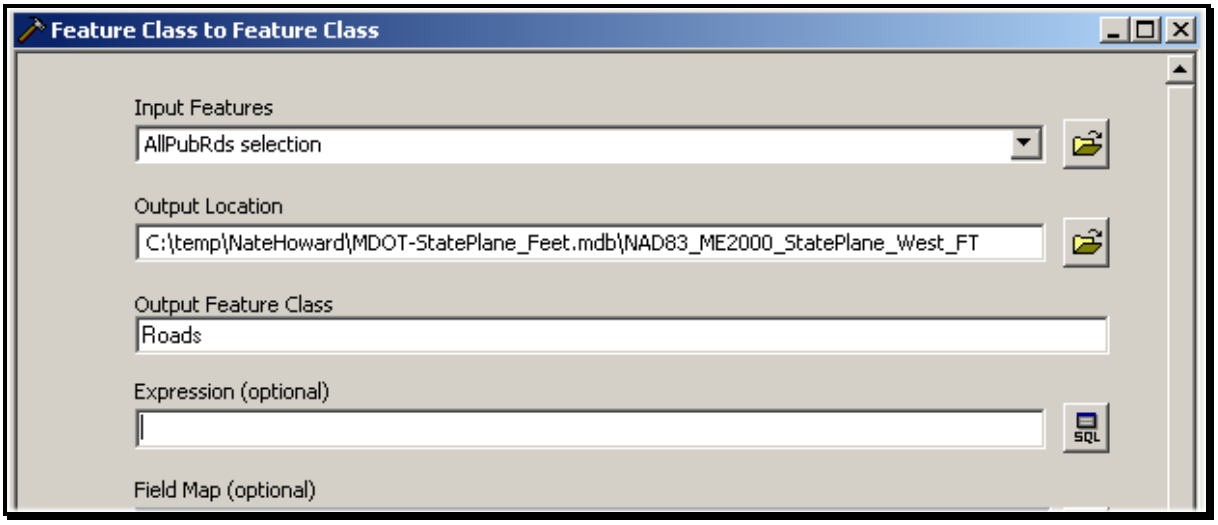


Figure 35-49: Dialog setup with the sample data.

Step Two: Test with ArcMap (optional only)

If you would like to test the resulting file, open ArcMap and select the *Add Data* button and browse to the State Plane Geodatabase's *Feature Dataset* and select the map (i.e. ME2000_SPW_FT) and the new *Feature Class* you just created. When mapped together, the data should fall in the correct location on the map. The Map will need to be the last thing listed in ArcMap.

Step Three: Export to CAD

Browse to the Geodatabase containing the GIS data that was re-projected. Right click the *Feature Class* within the *Feature Dataset* and select **Export>To CAD** (Figure 35-50).

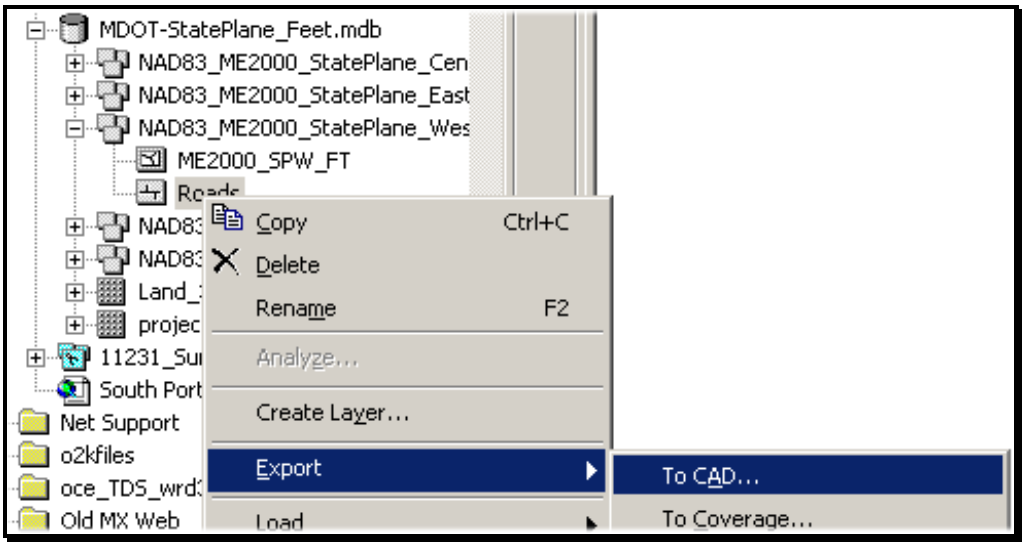


Figure 35-50: Right Click and select Export>To CAD.

Step Four: Adjust the Export to CAD Dialog

Part One: Adjust the Output Type

Select the *Output Type* down-arrow and select **DGN_V8** from the list of options (Figure 35-51).

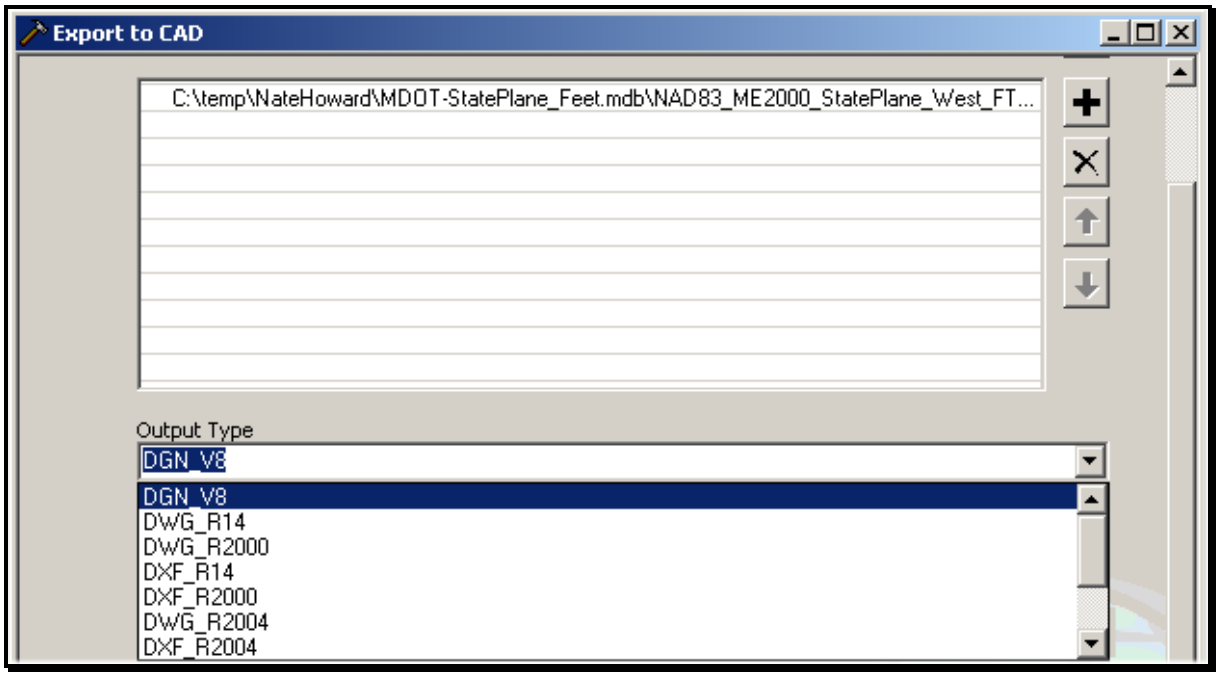


Figure 35-51: Adjust the Output Type to DGN_V8.

Part Two: Adjust the Output File Location/Name

Select the browse button next to the *Output File* field and browse to the proposed location of the output file and supply a name **including the file extension .dgn** as seen in Figure 35-52.

- It is recommended that you place the new .dgn within the project directory. Certain privileges may prevent you from placing into a workgroup folder. Place this in the topo folder for the project and someone else can move it if necessary.

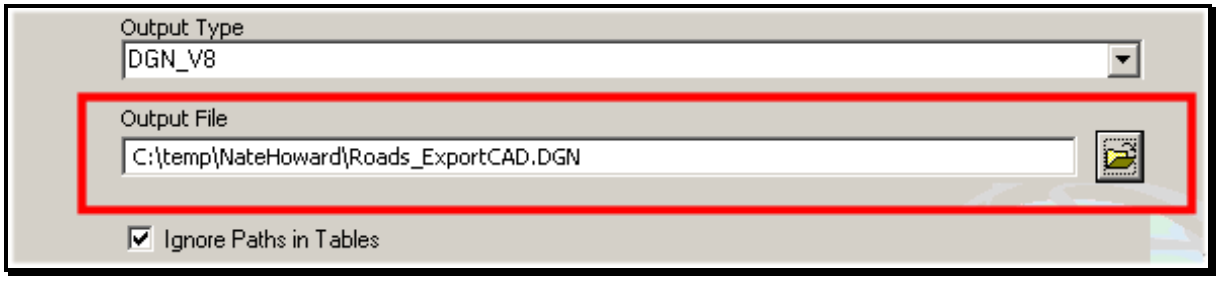


Figure 35-52: Adjust the file location and name. Add the .dgn extension.

Part Three: Browse and Add MaineDOT Seed File

Select the browse button next to the *Seed File (optional)* and browse to the G:\CADD\StdCADDSeeds\ folder and select the usMDOT_SEED.DGN from the list and click **Add** (Figure 35-53).

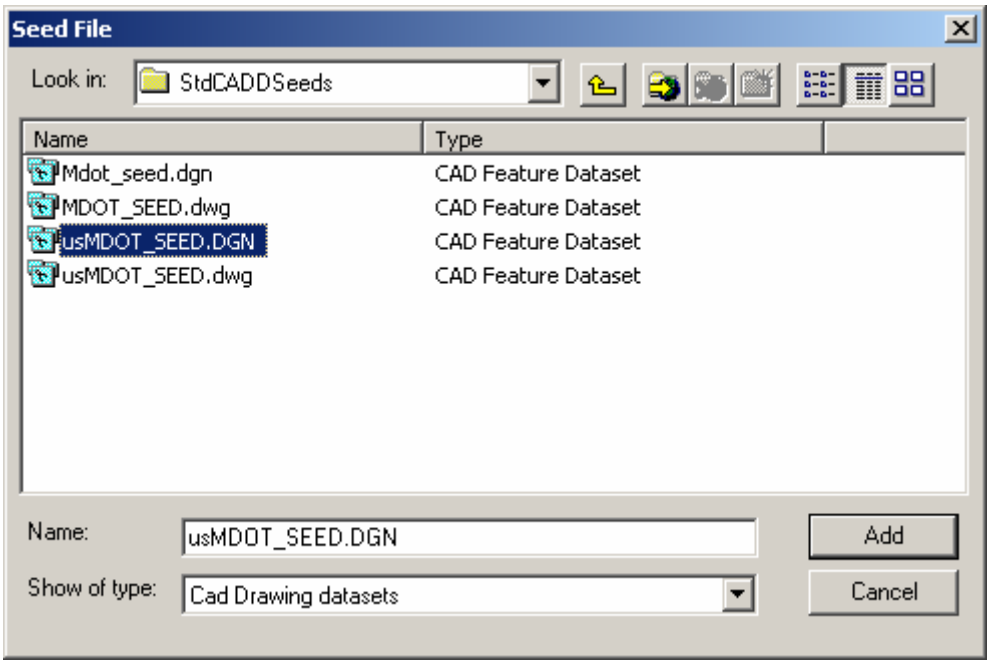


Figure 35-53: Select the appropriate seed file based on units and file type.

Part Four: Click OK to Process

Click **OK** to process the file.

Step Five: Test with ArcMap (optional only)

If you would like to test the resulting file, open ArcMap and select the *Add Data* button and browse to the Geodatabase's *Feature Dataset* and select the map (i.e. ME2000_SPW_FT). Now browse to the CADD file that was exported. You may get an error stating that there is no spatial reference for the file, but it should fall in the correct location.

Step Six: Reference to CADD Files

Within MicroStation, you or others can open an existing MicroStation file and select **File>Reference (DOT) Attach** to view the information with other CADD drawings for the project.